

**NASA Contractor Report 3690**

NASA  
CR  
3690  
c.1

# **OSHA Medical and Workplace Surveillance Requirements and NIOSH Recommendations**

**For Employees Exposed to Toxic Substances  
and Other Work Hazards**

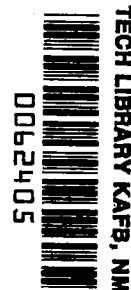
**Linda P. Cooper**

**CONTRACT NASW-3510  
FEBRUARY 1983**

**LOAN COPY: RETURN TO  
AFWL TECHNICAL LIBRARY  
KIRTLAND AFB, N.M. 87117**



**NASA**





**NASA Contractor Report 3690**

# **OSHA Medical and Workplace Surveillance Requirements and NIOSH Recommendations**

**For Employees Exposed to Toxic Substances  
and Other Work Hazards**

**Linda P. Cooper**  
*BioTechnology, Inc.*  
*Falls Church, Virginia*

**Prepared for**  
**The NASA Occupational Health Office**  
**Under Contract NASW-3510**



**National Aeronautics  
and Space Administration**

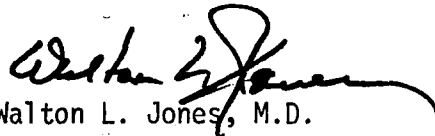
**Scientific and Technical  
Information Branch**

**1983**

## Preface

The health of every NASA employee is important. Good health means personal happiness, advancement opportunities, and increased job satisfaction for employees and translates into improved agency productivity, better personnel programs, and lower costs for the Agency.

Since its inception, NASA has recognized its responsibility to provide a healthful workplace within a unique aerospace environment. In the wake of ever-increasing additions to environmental health regulations and health protection information, the role of the occupational health professional has become more complex. Because we continually strive to improve the NASA Occupational Health Program, we have prepared this document that summarizes the workplace monitoring, recordkeeping, and medical surveillance requirements of OSHA health standards and the recommendations contained in the NIOSH criteria documents. This document is used by NASA as a guideline to assist occupational health professionals in performing their duties. We hope this will be of benefit to others who share our concern for protecting employee health.



Walton L. Jones, M.D.

Director, NASA Occupational Health Office

## ACRONYMS, DEFINITIONS, AND GENERAL INFORMATION

### Acronyms

CNS	— Central nervous system
DMR	— Designated medical representative
DOL	— Department of Labor
DR	— Designated representative
HHS	— Health and Human Services
IH	— Industrial hygiene
LEL	— Lower explosive limit
MSHA	— Mining Safety and Health Administration
NIOSH	— National Institute for Occupational Safety and Health
OSHA	— Occupational Safety and Health Administration
PEL	— Permissible exposure limit
PIH	— Professional industrial hygienist
SCBA	— Self-contained breathing apparatus
SSN	— Social security number
TWA	— Time-weighted average
WBGT	— Wet bulb-globe temperature

### Definitions

**Assistant Secretary**—Assistant Secretary of Labor for Occupational Safety and Health (OSHA), U.S. Department of Labor, or designee.

**Director**—Director, National Institute for Occupational Safety and Health (NIOSH) or any person directed by him or the Secretary of Health and Human Services (HHS) to act for the Director.

**Personal monitoring**—Monitoring where samples representative of the exposure to a substance in the breathing zone of the employee are taken.

### General Information

#### Monitoring Requirements

Unless otherwise specified, for each determination of the concentration of a substance, a sufficient number of samples shall be taken to characterize the employee's work and production schedules, location, and duties. Changes in production schedules shall be considered in deciding when samples are to be collected.

### Personal Protective Requirements

**Eye protection**—Selection, use, and maintenance of eye protection equipment shall be in accordance with provisions of the American National Standards Institute Practice for Occupational and Educational Eye and Face Protection, ANSI Z87.1—1968. Eye protection shall conform with 29 CFR 1910.133.

**Respiratory protection**—Unless otherwise specified, the use of respirators to achieve compliance with the recommended exposure is permitted only during the time necessary to install or test the required engineering controls, during emergencies when the concentration of an airborne substance may exceed the permissible environmental limit, and for nonroutine operations such as maintenance or repair. When respirator use is permitted, it shall be selected and used pursuant to the following requirements unless otherwise specified:

1. The employer shall establish and enforce a respiratory protective program meeting the requirements of 29 CFR 1910.134.
2. The employer shall ensure that no employee is exposed to a substance because of improper respirator selection, fit, use, or maintenance.
3. Respirators shall be those approved under the provisions of 30 CFR 11.
4. Respirators specified in higher concentrations may be used in atmospheres of lower concentrations.

The tables referred to in this Summary are not contained herein, but are found in each specific document.

#### Recordkeeping Requirements

If an industrial hygiene survey is required, the basis for concluding that no occupational exposure exists shall also be included in the records.

OSHA Standard 1910.20 supersedes the recordkeeping requirements specified here. However, since so much of the information corresponds, it was not deleted from the summary.



## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>2-Acetylaminofluorene (1910.1014, 11/78)</b></p>	<ol style="list-style-type: none"> <li>1. Physical exam, with attention (attn) to:               <ol style="list-style-type: none"> <li>a. Decreased immuno-competence;</li> <li>b. Treatment with steroid or cytotoxic agent;</li> <li>c. Pregnancy;</li> <li>d. Cigarette smoking.</li> </ol> </li> <li>2. Personal, family, and occupational histories, including:               <ol style="list-style-type: none"> <li>a. Genetic factors;</li> <li>b. Environmental factors.</li> </ol> </li> </ol>	<p>At least annually</p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment for all authorized personnel and for those considered for assignment to enter regulated areas.</li> <li>2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized copies thereof, shall be forwarded by registered mail to the Director.</li> <li>3. Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>2-Acetylaminofluorene</b> (1910, 1014)		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where 2-acetylaminofluorene is manufactured, processed, used, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<b>Protective clothing</b> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where 2-acetylaminofluorene is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of 2-acetylaminofluorene in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which 2-acetylaminofluorene is present in each regulated area.</li> <li>3. Incidents resulting in release of 2-acetylaminofluorene into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>2-Acetylaminofluorene</b> (continued)			<b>Respiratory protection</b> 3. Employees engaged in 2-acetylaminofluorene handling operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with and required to wear, a half-faced, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.  <b>Hygiene practices</b> 4. Personal hygiene measures are specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.	time involved, and an explanation of the procedure used in determining this figure; a description of the area involved, and the extent of known employee exposure; any medical treatment given, or surveillance implemented; an analysis of the circumstances of the incident, and measures taken to avoid further releases.					

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Acetylene (NIOSH 76-195, 7/76)	1. Medical and work histories. 2. Physical exam.	<b>Not specified</b> 1. Same as in A.	No requirements specified.	<b>In an emergency</b> 1. Proper medical care.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Acetylene (NIOSH 76-195, 7/76)	<ol style="list-style-type: none"> <li>1. TWA: 2,662 (2,500).</li> <li>2. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods shown to be at least equivalent in accuracy, precision, and sensitivity.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Where workers may be occupationally exposed to acetylene, IH surveys shall be conducted to evaluate exposure conditions.</li> <li>2. Repeat within 30 days of installation of a new process or any process change.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If it is determined that acetylene concentrations are greater than the PEL, a program of personal monitoring shall be instituted to identify and measure the exposure.</li> <li>4. Samples representative of the environmental exposure shall be collected.</li> <li>5. Monitoring shall be repeated at 30-day intervals where the concentration has been found to exceed the PEL. This shall continue until 2 consecutive determinations indicate that exposure no longer exceeds the PEL.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Individuals handling acetylene cylinders shall wear leather-type gloves and safety shoes.</li> <li>2. Recommended that welders or cutters wear leather and fiber-frame spectacles.</li> <li>3. Metal belt buckles and buttons that could become heated should be avoided.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. Use of respirators is not indicated except for the occurrence of a life-threatening emergency situation. Here, emergency respiratory equipment shall be available.</li> </ol> <p><b>Hygiene practices</b></p> <ol style="list-style-type: none"> <li>5. Smoking, introducing any source of ignition, or causing any form of ignition shall be prohibited where acetylene is produced, stored, handled, or used. This does not apply to deliberate introduction of ignition sources used in routine operations.</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of all IH surveys shall be maintained.</li> <li>2. Personal monitoring records shall be maintained for at least 5 yrs after termination of employment.</li> <li>3. Includes the determined concentration of exposure; a description of the monitoring, sampling, and analytical methods used; personal protective equipment used; and identification of the employee.</li> <li>4. Shall be available to DR of the Sec. of HHS, of the Sec. of Labor, and of the employee.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure at a concentration greater than the PEL.</li> </ol>

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Acrylamide (NIOSH 77-112, 10/76)	<ol style="list-style-type: none"> <li>1. Medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Weight loss;</li> <li>b. Neurologic disturbances.</li> </ol> </li> <li>2. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Eyes;</li> <li>c. Nervous system.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Interim medical and work histories.</li> <li>2. Complete physical exam as in A.2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after termi- nation of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the former employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. If exposed, weekly exam of fingertips, of hands, and other parts, looking for skin peeling.</li> </ol> <b>In an emergency</b> <ol style="list-style-type: none"> <li>2. First aid and prompt medical attention.</li> <li>3. Observation and follow-up for delayed neurological effects.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Acrylamide (NIOSH 77-112, 10/76)	1. TWA: 0.3.  2. Procedures for the collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any method shown to be at least equivalent in accuracy, precision, and sensitivity.	<b>Industrial hygiene survey</b>  1. Each employer who has a place of employment in which acrylamide is present shall determine by an IH survey if exposures are above the action level.  2. Repeat annually or within 30 days of any process change likely to result in an increase of airborne concentrations of acrylamide.  <b>Personal monitoring</b>  3. If it has been decided that concentrations may exceed the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to acrylamide.  4. Each operation in each work area shall be sampled every 3 mos or as otherwise indicated by a PIH.  5. If an employee is found to be exposed to acrylamide in excess of the PEL, the exposure of that employee shall be measured weekly,	<b>Protective clothing</b>  1. Gloves, aprons, long-sleeved overalls, footwear, and face shields (8 in minimum) shall be worn where needed to limit skin contact with acrylamide.  2. Impervious clothing may be needed in specialized operations.  <b>Eye protection</b>  3. Chemical safety goggles or face shields and safety glasses with side shields shall be worn in any operations in which acrylamide (solid, liquid, or spray) may come into contact with eyes.  <b>Respiratory protection</b>  4. When permissible, respirators shall be selected in accordance with Table I-1.  5. In case of an accident which could result in employee exposure in excess of the PEL, the employer shall provide respiratory protection as listed in Table I-1.  <b>Hygiene practices</b>  6. Sanitation measures specified.	1. Records of all IH surveys shall be maintained.  2. Personal monitoring shall be maintained for at least 20 yrs.  3. These records shall include the dates of measurements, job function and location of the employees at the worksite, sampling and analytical methods used, number, duration, and results of the samples taken, TWA concentrations estimated from these samples, type of personal protective equipment used, and exposed employees' names.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = work in any area where acrylamide is stored, produced, processed, or used; except as an unintentional contaminant in other materials at a concentration of less than 1% by weight.  2. Action level = 1/2 the PEL.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Acrylamide (continued)		controls initiated, and the employee notified. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate the employee's exposure no longer exceeds the PEL; routine monitoring may then be resumed.							

## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>Acrylonitrile (1910.1045, 11/78)</b></p>	<ol style="list-style-type: none"> <li>1. Applies only to those exposed to acrylonitrile at or above the action level, w/o regard to use of respirators.</li> <li>2. Work and medical histories, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Respiratory system;</li> <li>c. Gastrointestinal system;</li> <li>d. CNS dysfunctions, such as headache, nausea, vomiting, dizziness, and weakness.</li> </ol> </li> <li>3. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Central and peripheral nervous system;</li> <li>b. Gastrointestinal system;</li> <li>c. Respiratory system;</li> <li>d. Skin;</li> <li>e. Thyroid;</li> <li>f. 14" x 17" post/ant chest X-ray;</li> <li>g. Further tests of the gastrointestinal tract, including fecal occult blood screening, for &gt;40 yrs old and as DBRP.</li> </ol> </li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Applies only to those exposed to acrylonitrile at or above the action level, w/o regard to use of respirators.</li> <li>2. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer, on all employees subject to medical surveillance as required by this standard.</li> <li>2. Include a copy of the physician's written opinion, any employee complaints related to acrylonitrile exposure, a copy of the information provided to the physician by the employer, and a copy of the employee's medical and work history.</li> <li>3. Shall be available to the Assistant Sec. and the Director, as well as to the employee and DMR.</li> <li>4. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor records shall be transmitted to the Director.</li> </ol>	<ol style="list-style-type: none"> <li>1. For those developing signs/symptoms associated with exposure:               <ol style="list-style-type: none"> <li>a. Appropriate examinations.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Acrylonitrile (1910.1045)	1. TWA: (2). 2. Ceiling limit for 15 min: (10). 3. No employee shall be exposed to skin or eye contact with liquid AN.	1. Determination of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to AN over an 8-hr period. 2. Each employer who has a place of employment in which AN is present shall monitor each workplace and work operation to determine employee exposure. 3. If exposure is below the action level, monitoring for that employee may be discontinued. 4. If exposure is at or above the action level but below the PEL, monitoring shall be conducted quarterly. This shall continue until at least 2 consecutive measurements, at least 7 days apart, are below the action level. 5. If exposure is in excess of the PEL, monitoring shall be conducted monthly until at least 2 consecutive measurements, taken at least 7 days apart, are below the PEL.	<b>Protective clothing</b> 1. Where eye or skin contact with liquid AN may occur, the employer shall provide and assure that employees wear impermeable protective clothing or other equipment to protect any area of the body which may come into contact with liquid AN. 2. The employer shall assure that no employee removes protective clothing or equipment from the change room, except for those employees authorized to do so for the purpose of laundering, maintenance, or disposal. 3. Any person who launders or cleans protective clothing or equipment shall be informed of the potentially harmful effects of exposure to AN. 4. Impermeable protective clothing which contacts or is likely to have contacted liquid AN shall be decontaminated before being removed by the employee.	1. Where the processing, use, and handling of materials made from or containing AN are exempted, the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption. 2. This record shall include the material qualifying for exemption; the source of the objective data; the testing protocol, results of testing, and/or analysis of the material for the release of AN; a description of the operation exempted, and how the data supports the exemption; and other relevant data. 3. Maintain for the duration of the employer's reliance upon such objective data. 4. Exposure monitoring records shall be maintained for at least 40 yrs, or for the duration of employment plus 20 yrs, whichever is longer. 5. This record shall include the dates, number, duration, and results of each of the samples taken, including a description of	Yes	Yes	Yes	1. AN = acrylonitrile 2. Action level = a concentration of AN of 1 PPM as an 8-hr TWA. 3. This standard does not apply to exposures which result solely from the processing, use, and handling of the following materials: a. ABS resins, SAN resins, nitrile barrier resins, solid nitrile elastomers, and acrylic and modacrylic fibers, when these listed materials are in the form of finished polymers, and products fabricated from such finished polymers; b. Materials made from and/or containing AN for which objective data is reasonably relied upon to demonstrate that the material is not capable of releasing AN in airborne concentrations in excess of 1 ppm as an 8-hr TWA, under the	

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Acrylonitrile</b> (continued)			5. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
<b>Acrylonitrile</b> (continued)		<p>6. Monitoring shall also be conducted whenever there has been a production, process, control, or personnel change which may result in new or additional exposures to AN, or whenever the employer has any other reasons to suspect a change which may result in new or additional exposures to AN.</p> <p>7. The method of measurement of employee exposure shall be accurate to a confidence level of 95% to within <math>\pm 35\%</math> for concentrations of AN at or above the PEL, and <math>\pm 50\%</math> for concentrations of AN below the PEL.</p> <p>8. Regulated areas shall be established where AN concentrations are in excess of the PEL.</p> <p>9. Access to regulated areas shall be limited to authorized personnel.</p> <p>10. Where there is the possibility of employee exposure to AN in excess of the ceiling limit, a general alarm shall be installed and used</p>	<p><b>Respiratory protection</b></p> <p>5. Respirators shall be used during the time period necessary to install or implement feasible engineering and work practice controls; in work operations, such as maintenance and repair activities or reactor cleaning, in which the employer establishes that engineering and work practice controls are not feasible; in work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the PEL; and in emergencies.</p> <p>6. Respirators shall be selected in accordance with Table I of the standard.</p> <p>7. The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134 (b), (d), (e), and (f).</p> <p>8. Respirators shall be approved for use with organic vapors by NIOSH under the provisions of 30 CFR Part 11.</p>	<p>the sampling procedure used to determine representative employee exposure; a description of the sampling and analytical methods used and the data relied upon to establish that the methods used meet accuracy and precision requirements; the type of respiratory protective devices worn, if any; and the name, SSN, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent.</p> <p>6. All records shall be available to the Assistant Sec. of Labor for OSHA, and the Director of NIOSH, and the employees or their DR.</p> <p>7. Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained.</p> <p>8. Whenever the employer ceases to do business and there is no successor employer, these records shall be transmitted to the Director of NIOSH.</p>					<p>expected conditions of processing, use, and handling which will cause the greatest possible release; and</p> <p>c. Solid materials made from and/or containing AN which will not be heated above 170°F during handling, use, or processing.</p>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Acrylonitrile (continued)</b>		<p>to promptly alert employees.</p> <p>11. The employer shall provide affected employees, or their DR, an opportunity to observe any monitoring of employee exposure to AN.</p> <p>12. Within 5 working days after receipt of the results of monitoring, the employer shall notify each employee in writing of the results which represent that employee's exposure.</p> <p>13. Whenever the results indicate that the employee exposure exceeds the PEL, the employer shall include in the written notice a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure to or below the PEL.</p>	<p>9. Where air-purifying respirators (chemical cartridge- or canister-type) are used, the air-purifying canister or cartridge(s) shall be replaced prior to the expiration of their service life or at the completion of each shift, whichever occurs first. A label shall be attached to the cartridge or canister to indicate the date and time at which it is first installed on the respirator.</p> <p>10. Qualitative fit tests shall be performed at the time of initial fitting and at least semiannually thereafter for each employee wearing a respirator.</p> <p>11. Quantitative fit testing shall be performed if there are more than 10 employees wearing negative pressure respirators. This shall also be performed at least semiannually for each such employee.</p> <p><b>Hygiene practices</b></p> <p>12. Personal hygiene measures specified.</p>	<p>9. At the expiration of the retention period for the records required to be maintained, the employer shall notify the Director at least 3 mos prior to the disposal of the records, and shall transmit them to the Director upon request.</p>				



## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Alkanes (C5-C8) (NIOSH 77-151, 3/77)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, emphasizing conditions affecting:               <ol style="list-style-type: none"> <li>a. Peripheral and central nervous system;</li> <li>b. Skin.</li> </ol> </li> <li>2. Physical exam, with general tests of:               <ol style="list-style-type: none"> <li>a. Nervous system functions;</li> <li>b. Skin condition.</li> </ol> </li> <li>3. Ability to use positive and negative pressure respirators.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to the DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Alkanes (C5-C8) (NIOSH 77-151, 3/77)	1. TWA: 350. (This concentration is equivalent to 120 parts of pentane per million parts of air, 100 ppm of hexane, 85 ppm of heptane, or 75 ppm of octane.)  2. For exposure to a mixture of alkanes, TWA: 350.  3. Ceiling limits for both individual alkanes and mixtures for 15 min: 1,800. (Equivalent to 610 ppm pentane, 510 ppm hexane, 440 ppm heptane, and 385 ppm octane.)  4. Procedures for the collection of workplace environmental	<b>Industrial hygiene survey</b>  1. Workers are not considered to have occupational exposure to alkanes if concentrations, as determined on the basis of an IH survey, do not exceed the action level.  2. Repeat at least once a yr and within 30 days after any process change likely to result in increases of airborne alkanes.  <b>Personal monitoring</b>  3. If occupational exposure exists, a program of personal monitoring shall be instituted to identify and measure the exposures of all employees occupationally exposed to alkanes.  4. Monitoring shall be conducted every 6 mos.  5. If monitoring reveals that an employee is exposed in excess of either PEL, control measures shall be initiated, the employee notified, and the exposure of the employee measured at least once every 30 days. This shall continue until	<b>Skin protection</b>  1. The employer shall provide protective apparel, including gloves, aprons, suits, and boots, and ensure they are worn where needed to prevent skin contact with liquid alkanes.  2. Protective apparel shall be made of materials which most effectively prevent skin contact under the conditions for which it is deemed necessary.  3. Rubber articles may be used provided care is taken to ensure permeation does not occur during usage.  4. Protective apparel should be discarded at the first sign of deterioration.  <b>Eye protection</b>  5. Full-facepiece respirators, safety glasses, or chemical safety goggles shall be provided and worn by workers during operations in which alkanes may splash into the eyes.  6. Face shields are not adequate when used alone; they must augment safety	1. Records of all IH surveys shall be maintained. Personal monitoring shall be maintained for at least 30 yrs after last occupational exposure.  2. These records shall include the dates of measurements, job function and location of the employees at the worksite, sampling and analytical methods used, number, duration, and results of the samples taken, TWA concentrations estimated from these samples, type of personal protective equipment used, and exposed employees' names.  3. Each employee shall have access to information on his or her own environmental exposures.  4. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = exposure above the action level.  2. Action level = airborne TWA of 200 mg/m <sup>3</sup> for up to 10 hrs in a 40-hr workweek.  3. Where spark- and flame-generating operations are necessary, they shall be started only after an authorized representative of the employer signs a permit declaring the operations to be safe. This shall be done only after a calibrated combustible-gas meter or other suitable instrument indicates that the concentration of alkane vapors is below 10% LEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Alkanes (C5-C8)</b> (continued)	samples shall be as provided in Appendix I, or by any method shown to be at least as efficient. Analysis of samples shall be performed as provided in Appendix II or by any methods shown to be at least equivalent in precision, sensitivity, and accuracy.	2 consecutive samplings, at least 1 wk apart, indicate the employee's exposure no longer exceeds the PEL.	glasses or chemical safety goggles. <b>Respiratory protection</b> 7. When permissible, respirators shall be selected in accordance with Table I-1. 8. Each area where posting is required due to occupational exposure to alkanes shall have emergency protective devices readily available in nearby locations which do not require entry into a contaminated area for access. 9. Respiratory protective devices provided for emergencies shall consist of at least 2 SCBAs; well-ventilated outdoor locations where egress and escape are unhindered may be exempted from this requirement.						

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Allyl chloride (NIOSH 76-204, 9/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Respiratory system;</li> <li>b. Liver;</li> <li>c. Kidneys;</li> <li>d. Skin;</li> <li>e. Eyes.</li> </ol> </li> <li>2. Physical exam.</li> <li>3. Clinical tests:               <ol style="list-style-type: none"> <li>a. 14" x 17" chest X-ray;</li> <li>b. Pulmonary function (FVC, FEV1.0);</li> <li>c. Complete blood count;</li> <li>d. Complete urinalysis, with microscopic exam;</li> <li>e. Liver function tests (SGOT, SGPT determinations).</li> </ol> </li> <li>4. Ability to use negative or positive pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Interim medical and work histories.</li> <li>2. Liver function tests and urinalysis as described in A.3.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If overexposed</b> <ol style="list-style-type: none"> <li>1. Physical exam.</li> <li>2. Urinalysis.</li> <li>3. Liver function tests.</li> <li>4. Pulmonary function tests.</li> <li>5. Other tests, as DBRP.</li> <li>6. If in direct contact, consider eye and skin irritations during physical exam.</li> </ol> <b>In an emergency</b> <ol style="list-style-type: none"> <li>7. Administration of first aid.</li> <li>8. If eye contact or vapor inhalation, consult physician.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Allyl chloride (NIOSH 76-204, 9/76)	1. TWA: ~3.1 (1.0).  2. Ceiling limit for 15 min.; ~9.4 (3.0).  3. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II or by any methods shown to be equivalent in accuracy, precision, and sensitivity.	<b>Industrial hygiene survey</b>  1. Each employer who has a place of employment in which allyl chloride vapor is released into the work environment shall determine by an IH survey if exposures above the action level may occur.  2. Repeat once every 3 yrs and within 30 days of any process change likely to result in increased airborne concentrations of allyl chloride.  <b>Personal monitoring</b>  3. If it has been decided that the environmental concentration may exceed the action level of the PEL, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed above the action level.  4. Source and area monitoring may be used to supplement personal monitoring.  5. If an employee is exposed above the action level, the exposure of that employee shall be monitored at least once every 3 mos.	<b>Protective clothing</b>  1. Appropriate protective apparel, including gloves, aprons or suits, boots, and face shields (8 in minimum) shall be provided and worn as needed to prevent skin contact.  2. Protective apparel shall be made of materials which most effectively prevent skin contact under the conditions for which it is deemed necessary.  3. Since leather articles cannot be effectively decontaminated, they shall be prohibited for use as protective apparel.  4. Rubber articles may be used provided care is taken to ensure that permeation does not occur during usage.  5. Protective apparel should be discarded at the first sign of deterioration.  <b>Eye protection</b>  6. Full-facepiece respirators or chemical safety goggles shall be worn in operations where allyl chloride may splash into the eyes.	1. IH survey records shall be maintained.  2. Environmental monitoring records shall be maintained for at least 20 yrs after the individual's employment has ended.  3. These records shall include the dates of measurements; job function and location of the employee within the worksite at time of sampling; sampling and analytical methods used and evidence of their accuracy; number, duration, and results of samples taken; TWA determinations based on these samples; type of personal protective equipment in use, if any; name and SSN of the employee being monitored; dates of employment with the company; and information regarding changes in job assignment.  4. Each employee and former employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Action level = 1/2 the TWA.	

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Allyl chloride (continued)</p>		<p>6. If an employee is found to be exposed in excess of the PEL (TWA or ceiling limit), controls shall be initiated and the employee notified. The exposure of that employee shall be measured at least once every 30 days. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that employee exposure no longer exceeds the PEL. Quarterly monitoring may then be resumed.</p>	<p>7. Faceshields may be used only to augment safety goggles where full facial protection is needed, but are not adequate alone.</p> <p><b>Respiratory protection</b></p> <p>8. When permissible, respirators shall be selected in accordance with Table I-1 and the employer shall ensure that the employee uses the respirator provided.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>					



## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>4-Aminodiphenyl (1910.1011, 11/78)</b></p>	<ol style="list-style-type: none"> <li>1. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Decreased immuno-competence;</li> <li>b. Treatment with steroid or cytotoxic agent;</li> <li>c. Pregnancy;</li> <li>d. Cigarette smoking.</li> </ol> </li> <li>2. Personal, family, and occupational histories, including:               <ol style="list-style-type: none"> <li>a. Genetic factors;</li> <li>b. Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment for all authorized personnel and all employees considered for assignment to enter regulated areas.</li> <li>2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>3. Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>4-Aminodiphenyl</b> (1910.1011)</p>		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where 4-aminodiphenyl is manufactured, processed, used, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where 4-aminodiphenyl is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in 4-aminodiphenyl handling operations involving</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of 4-aminodiphenyl in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities and the manner in which 4-aminodiphenyl is present in each regulated area.</li> <li>3. Incidents resulting in release of 4-aminodiphenyl into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>4-Aminodiphenyl</b> (continued)			<p>transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>explanation of the procedure used in determining this figure; a description of the area involved, and the extent of known employee exposure; any medical treatment given, or surveillance implemented; an analysis of the circumstances of the incident, and measures taken to avoid further releases.</p>					

## MEDICAL SURVEILLANCE

<p style="text-align: center;"><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p style="text-align: center;"><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p style="text-align: center;"><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Ammonia (NIOSH 74-136, 7/74)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Eyes;</li> <li>b. Skin;</li> <li>c. Upper respiratory system.</li> </ol> </li> <li>2. Pulmonary function tests.</li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<p>Not specified</p> <ol style="list-style-type: none"> <li>1. Medical surveillance for:               <ol style="list-style-type: none"> <li>a. Eyes splashed with ammonia;</li> <li>b. Signs/symptoms of eye irritation after exposure;</li> <li>c. Signs/symptoms of respiratory tract irritation;</li> <li>d. Skin irritation.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the period of employment for all workers whose employment may involve potential exposure in excess of 50 ppm.</li> <li>2. Shall be available to DMR of the Sec. of HHS, the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

OBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Ammonia (NIOSH 74-136, 7/74)	<ol style="list-style-type: none"> <li>1. Ceiling limit for 5 min: (50).</li> <li>2. Procedures for sampling, calibration of equipment, and analysis of ammonia samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Workroom areas shall be monitored for ammonia exposure if environmental levels, as determined on the basis of an IH survey or by the judgment of a compliance officer, exceed 1/2 of the 5-min ceiling limit of 50 ppm.</li> <li>2. Repeat IH surveys when any process change indicates a need for reevaluation or at the discretion of the compliance officer.</li> <li>3. If there is exposure to ammonia at concentrations at or above 25 ppm, environmental exposures shall be determined.</li> <li>4. In all monitoring, samples representative of the exposure in the breathing zone of at least 25% of the employees in each operation or process shall be collected. Each worker shall be included in the sampling at least every 2 yrs.</li> <li>5. Environmental samples shall be taken as soon as possible, but no later than 30 days after first operation of a new process or process change.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Personnel handling anhydrous or strong aqua ammonia where skin or eye contact is likely to occur shall wear gloves, shoe covers, and aprons impervious to ammonia. Also, chemical goggles and face shields.</li> <li>2. Personnel entering areas with an atmospheric concentration likely to be greater than 10,000 ppm shall wear impervious full body suits, a SCBA with positive pressure in a full facepiece, or a combination supplied air impervious suit, continuous flow type with auxiliary self-contained air supply.</li> <li>3. When the worker is using the impervious suit over a SCBA, stay time in the area shall be limited with due consideration to the heat stress factors involved.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. The employer shall provide appropriate respirators and ensure proper use when a variance has been granted under the provisions of OSHA to allow respirators</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained until the next survey is completed.</li> <li>2. Records of environmental measurements shall be maintained so that exposure information is available for individual employees and shall be maintained for the duration of that worker's employment.</li> <li>3. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Strong aqua ammonia is defined as aqueous solutions containing greater than 10% ammonia.</li> <li>2. Weak aqua ammonia is solutions of 10% or less.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ammonia (continued)</b>		6. Samples shall be collected at least semiannually.  7. If concentrations exceed the PEL, controls shall be instituted, the employee notified, and monitoring repeated weekly until 3 consecutive samplings indicate controls are effective.	as a means of control in routine operations, while the application for variance is pending, or whenever atmospheric concentrations exceed 50 ppm.  5. When permissible, respirators shall be selected in accordance with Table I-1 and the employer shall ensure that when required by circumstances, the employee uses the respirator provided.  6. Each area required to be posted for occupational exposure shall have emergency respiratory protection readily available in nearby locations which do not require entry into a contaminated atmosphere for access. Such respiratory protection shall consist of:  a. Outdoor areas: At least 2 full-face masks, a chest or back mounted type, with industrial size ammonia canisters (maximum life 2 hrs).  b. Indoor areas requiring worker entry to control spills or leaking tanks: At least 2 full-face gas masks, chest or back						



### MEDICAL SURVEILLANCE

<p style="text-align: center;"><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p style="text-align: center;"><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p style="text-align: center;"><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p style="text-align: center;">FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>B. PERIODIC REQUIREMENTS</b></p> <p style="text-align: center;">FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p style="text-align: center;">FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>D. OTHER REQUIREMENTS</b></p> <p style="text-align: center;">FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ammonia (continued)</b>			<p>mounted type, with industrial size ammonia canisters.</p> <p>c. Indoor/outdoor confined spaces with limited egress, such as tanks, pits, etc. requiring work entry: At least 2 SCBAs, pressure demand type (positive pressure).</p> <p>7. Canisters shall be discarded and replaced with fresh canisters after use. Unused canisters shall be discarded and replaced when the seal is broken, after 3 yrs if seals are unbroken, or on the manufacturer's recommendations; whichever is first.</p> <p><b>Hygiene practices</b></p> <p>8. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Antimony (NIOSH 78-216, 9/78)</b>	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, emphasizing:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Mucous membrane;</li> <li>Pulmonary system;</li> <li>Cardiac system.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Mucous membrane;</li> <li>Pulmonary system;</li> <li>Cardiac system.</li> </ol> </li> <li>Clinical tests:               <ol style="list-style-type: none"> <li>14" x 17" post/ant chest X-ray;</li> <li>ECG;</li> <li>Pulmonary function tests (FVC, FEV1.0).</li> </ol> </li> <li>Ability to use positive or negative pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>Interim medical and work histories.</li> <li>Physical exam and tests as in A.2 and 3.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after last occupational exposure for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Antimony (NIOSH 78-216, 9/78)	1. TWA: 0.5. 2. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b> 1. Employers shall determine by an IH survey whether exposure to airborne antimony is in excess of the action level. 2. Surveys shall be repeated at least annually and within 14 days after any process change likely to result in occupational exposure to antimony.  <b>Personal monitoring</b> 3. If it has been determined that occupational exposure to antimony occurs, the employer shall institute a program of personal monitoring to identify and measure the exposure of each employee. 4. Source and area monitoring may be used to supplement personal monitoring. 5. Each operation shall be sampled at least once every 6 mos. For intermittent operations, i.e., those lasting less than 6 mos, at least one monitoring regimen shall be conducted during each operation period, and monitoring	<b>Protective clothing</b> 1. Work and protective clothing appropriate for the work situation shall be provided by the employer. This may include underwear, cloth or calfskin gloves, coveralls or long-sleeved shirts and trousers, and head and neck protection. 2. When antimony halides are being processed in a manner that may result in skin contact, gloves with gauntlets and aprons of rubber or other resistant material shall be used. 3. The employer shall assure that appropriate work clothing is worn by every employee. 4. The employer shall ensure that a change of clothing is immediately available to any employee whose clothes become grossly contaminated or lose their protective quality. 5. If protective clothing becomes grossly con-	1. Records of IH surveys shall be maintained until the next survey is completed. 2. Records of environmental monitoring and other pertinent records shall be kept for at least 30 yrs after the employee's last work-related exposure to antimony. 3. Records of environmental monitoring shall include an identification of the employee being monitored; duties and job locations within the worksite; time and dates of sampling and analysis; sampling and analytical methods used and available evidence of their precision and accuracy; the number, duration, and results of samples taken; TWA concentrations determined from these samples; and the type of personal protective equipment used by the employee. 4. Each employee shall be able to obtain information on his or her environmental exposures and be permitted to obtain copies of the data.	Yes	Yes	Yes	1. Occupational exposure = exposure at or above 1/2 the TWA.	

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Antimony (continued)</b>		<p>should coincide with the periods of maximum potential exposure to antimony during these intermittent operations.</p> <p>6. If an employee is found to be exposed to antimony at concentrations exceeding the recommended TWA concentration limit, control measures shall be initiated, the exposure of that employee shall be measured at least once every wk, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the control measures have been effective and that the employee's exposure no longer exceeds the recommended exposure limit; routine semiannual monitoring may then be resumed.</p>	<p>taminated, or in the case of halides, if the resistant material is penetrated, this clothing must be removed immediately and not be reworn until the antimony compound is removed.</p> <p>6. Protective clothing shall be changed at least daily at the end of the shift.</p> <p>7. Contaminated clothing must be stored in closed containers until washed or discarded.</p> <p>8. The employer shall inform persons involved in laundering or handling the contaminated clothing of the hazardous properties of the contaminant.</p> <p><b>Eye protection</b></p> <p>9. Chemical safety goggles shall be provided by the employer and shall be worn during any operation in which there is a reasonable possibility of antimony entering the eyes.</p> <p>10. Where antimony halides may contact the eyes, employers shall provide</p>	<p>5. Records shall be made available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Antimony (continued)			<p>an eye wash fountain or other source of water within the immediate work area for flushing the eyes in an emergency.</p> <p><b>Respiratory protection</b></p> <p>11. When permissible, respirators shall be selected in accordance with Table I-1, and the employer shall ensure that, when needed, employees use the respirators provided.</p> <p>12. Initial selection and assignment of negative pressure respirators shall be made on the basis of qualitative or quantitative facepiece fit tests.</p> <p>13. The employer shall perform a routine periodic check of all personal protective equipment to maintain it in a safe state of repair and shall store it properly to prevent damage by heat, degrading chemicals, or other harmful agents.</p> <p><b>Hygiene practices</b></p> <p>14. Sanitation measures specified.</p>						



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Arsenic (inorganic)</b> <b>(1910.1018, 7/78)</b>	<ol style="list-style-type: none"> <li>Covered employees: <ol style="list-style-type: none"> <li>Those who are or will be exposed to arsenic at or above action level, w/o regard to use of respirators, at least 30 days/yr;</li> <li>Those who have been exposed as in 1.a for <math>\geq 10</math> yrs.</li> </ol> </li> <li>Work and medical histories, including presence and degree of respiratory symptoms, such as shortness of breath, cough, sputum production, and wheezing.</li> <li>Medical exam, including: <ol style="list-style-type: none"> <li>14" x 17" post/ant chest X-ray and International Office UICC/ Cincinnati (ILO U/C) rating;</li> <li>Nasal exam;</li> <li>Skin exam;</li> <li>Sputum cytology exam;</li> <li>Other exams, as DBRP.</li> </ol> </li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>For covered employees &lt;45 yrs old with &lt;10 yrs exposure, w/o regard to use of respirators.</li> <li>Same as in A.3.</li> </ol> <p><b>Semi-annually</b></p> <ol style="list-style-type: none"> <li>For all other covered employees.</li> <li>Same as in A.2 and 3.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer, for all employees who are or will be exposed above the action level, at least 30 days per yr; and for all employees who have been exposed above the action level, for 30 days or more per yr for a total of 10 yrs or more of combined employment with the employer or predecessor employers.</li> <li>Include the name, SSN, and description of duties of the employee; a copy of the physician's written opinions; results of any exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and any employee medical complaints related to exposure to inorganic arsenic.</li> </ol>	<ol style="list-style-type: none"> <li>For those developing signs/symptoms associated with exposure: <ol style="list-style-type: none"> <li>Appropriate examinations;</li> <li>Emergency medical treatment.</li> </ol> </li> </ol> <p><b>At least 6 mos preceding termination of employment</b></p> <ol style="list-style-type: none"> <li>Same as in A.2 and 3.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Arsenic (inorganic) (1910.1018)	1. TWA: 10 µg/ cu m.	<div>1. Personal monitoring shall be performed in each workplace or work operation where inorganic arsenic is used (with the exception of employee exposures in agriculture or resulting from pesticide application, the treatment of wood with preservatives, or the utilization of arsenically preserved wood).</div> <div>2. Full shift samples shall be collected (for at least 7 continuous hrs), including at least 1 sample from each shift for each job classification in each work area.</div> <div>3. If monitoring reveals exposure to be below the action level, monitoring need not be repeated except whenever a production, process, control, or personnel change has occurred which might result in increased exposures to inorganic arsenic.</div> <div>4. If exposure is found to exceed the action level but is below the PEL, monitoring shall be performed every 6 mos.</div>	<div>Protective clothing</div> <div>1. Where the possibility of skin or eye irritation from inorganic arsenic exists, and for all workers working in regulated areas, the employer shall provide at no cost to the employee and assure that employees use appropriate and clean protective work clothing and equipment.</div> <div>2. This shall include coveralls or similar full-body clothing, gloves, shoes or coverlets, and face shields or vented goggles.</div> <div>3. For exposure to arsenic trichloride, impervious clothing shall be provided.</div> <div>4. The employer shall provide protective clothing in a freshly laundered and dry condition at least weekly, and daily if the employee works in areas where exposures are over 100 µg/m<sup>3</sup> of inorganic arsenic or in areas where more frequent washing is needed to prevent skin irritation.</div>	<div>1. The employer shall establish and maintain an accurate record of all monitoring for at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer.</div> <div>2. Records shall include the dates, number, duration, location, and results of each sample taken, including a description of the sampling procedure used to determine representative employee exposure; a description of the sampling and analytical methods used and evidence of their accuracy; the type of respiratory protection devices worn, if any; name, SSN, and job classification of the employees monitored and of all other employees whose exposure the measurement is intended to represent; and the environmental variables that could affect the measurement.</div> <div>3. Shall be available to the Assistant Sec. of Labor for OSHA and the Director of NIOSH.</div>	Yes	Yes	Yes	<div>1. Action level = a concentration of inorganic arsenic of 5 µg/m<sup>3</sup> averaged over any 8-hr period.</div> <div>2. Regulated areas shall be established where worker exposures are in excess of the PEL.</div> <div>3. Access to these areas shall be limited to authorized persons.</div>	

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Arsenic (inorganic) (continued)			<p>3. The employee, in addition, shall keep, or assure the physician keeps, the following medical records:</p> <ul style="list-style-type: none"> <li>a. A copy of the medical examination results including medical and work history;</li> <li>b. A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;</li> <li>c. The initial X-ray;</li> <li>d. The X-rays for the most recent 5 yrs;</li> <li>e. Any X-rays with a demonstrated abnormality and all subsequent X-rays;</li> <li>f. The initial cytologic examination slide and written description;</li> <li>g. The cytologic examination slide and written description for the most recent 5 yrs; and</li> <li>h. Any cytologic examination slides with demonstrated</li> </ul>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Arsenic (inorganic) (continued)		<div>5. If concentrations exceed the PEL, controls shall be instituted, the employee notified, and monitoring repeated quarterly until 2 consecutive samplings, at least 7 days apart, indicate controls are effective.</div> <div>6. For inorganic arsenic concentrations <math>\geq 10 \mu\text{g}/\text{m}^3</math>, a monitoring/measurement method must be used which has an accuracy of not less than <math>\pm 25\%</math>. For concentrations <math>&gt; 5 \mu\text{g}/\text{m}^3</math> but <math>&lt; 10 \mu\text{g}/\text{m}^3</math>, the method shall have an accuracy of not less than <math>\pm 35\%</math>.</div> <div>7. Affected employees or their DR shall be given the opportunity to observe any monitoring of exposure to inorganic arsenic.</div> <div>8. Within 5 working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.</div> <div>9. Whenever the results indicate that the representative employee exposure exceeds the PEL, the employer shall include</div>	<div>5. The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.</div> <div>6. The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms.</div> <div>7. The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change room which prevents dispersion of inorganic arsenic outside the container.</div> <div>8. The employer shall inform in writing any person who cleans or launders clothing of the potentially harmful effects including the carcinogenic effects of exposure to inorganic arsenic.</div> <div>9. The employer shall assure that the containers of contaminated protective clothing and equipment in the workplace or</div>	<div>4. Whenever the employer ceases to do business, the successor employer shall receive and maintain all records.</div> <div>5. When there is no successor employer, the records shall be transmitted to the Director of NIOSH.</div> <div>6. At the expiration of the retention period for the records required to be maintained, the employer shall notify the Director at least 3 mos prior to the disposal of such records, and shall transmit those records to the Director if he requests them within that period.</div>				

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Arsenic (inorganic) (continued)			<p>atypia, if such atypia persists for 3 yrs, and all subsequent slides and written descriptions.</p> <p>4. Shall be available to the Assistant Sec. of OSHA and the Director of NIOSH for examination and copying.</p> <p>5. Employees or DMR shall also have access to these records.</p> <p>6. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director.</p> <p>7. At the expiration of the retention period, the em- ployer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.</p>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Arsenic (Inorganic)</b> (continued)		in the written notice a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure to or below the PEL.	which are to be removed from the workplace are labeled.  10. The employer shall prohibit the removal of inorganic arsenic from protective clothing or equipment by blowing or shaking.  <b>Respiratory protection</b>  11. Respirators shall be used during the time period necessary to install or implement feasible engineering controls; in work operations such as maintenance and repair activities in which engineering work practice controls are not feasible; in emergencies; and where engineering controls and work practices are not yet sufficient to reduce exposures to or below the PEL.  12. When permissible, respirators shall be selected in accordance with Table I for inorganic arsenic compounds without significant vapor pressure, or Table II for inorganic arsenic						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Arsenic (inorganic)</b> (continued)			<p>compounds which have significant vapor pressure.</p> <p>13. Where exposures exceed the PEL for inorganic arsenic and also exceed the relevant limit for particular gases (e.g., SO<sub>2</sub>), any air purifying respirator supplied to the employee must have a combination high efficiency filter with an appropriate gas sorbent.</p> <p>14. All respirators shall be NIOSH approved under 30 CFR 11.</p> <p>15. Qualitative fit testing shall be performed at the time of the initial fitting and semiannually thereafter, where quantitative fit tests are not required.</p> <p>16. Employers with greater than 20 employees wearing respirators shall perform a quantitative face fit test at the time of initial fitting and at least semiannually thereafter for each employee wearing negative pressure respirators.</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Arsenic (inorganic)</b> (continued)			<p>17. If an employee has demonstrated difficulty in breathing during the fitting test or during use, he/she shall be examined by a physician trained in pulmonary medicine to determine whether the employee can wear a respirator while performing the required duty.</p> <p>18. The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.</p> <p>19. Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece to prevent skin irritation associated with respirator use.</p> <p><b>Hygiene practices</b></p> <p>20. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Asbestos</b> <b>(1910.1001, 11/78)</b>	<ol style="list-style-type: none"> <li>For those exposed to airborne concentrations.</li> <li>Medical exam, with a minimum of:               <ol style="list-style-type: none"> <li>14" x 17" post/ant chest X-ray;</li> <li>Pulmonary function tests (FVC, FEV1.0).</li> </ol> </li> <li>Medical history, eliciting symptomology of respiratory diseases.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>For those exposed to airborne concentrations.</li> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 20 yrs for all employees exposed.</li> <li>Provide upon request to employee, DMR, and the Assistant Sec. of Labor, as well as the Director of NIOSH.</li> <li>Any physician who conducts a medical examination required by the OSHA Standard shall furnish to the employer of the examined employee all information specifically requested, and any other medical information related to occupational exposure to asbestos.</li> </ol>	<b>30 days prior to termination of employment</b> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Asbestos (1910.1001)	1. TWA: 2 fibers/cm <sup>3</sup> . (The fibers shall not exceed 5 µm in length.)  2. Ceiling limit: 10 fibers/cm <sup>3</sup> . (No employee shall be exposed at any time to airborne concentrations of asbestos in excess of this.)	1. All determinations of air- borne concentrations of asbestos shall be made by the membrane filter method at 400-450x (magnification) (4 mm objective) with phase contrast illumination.  2. Every employer shall cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether every employee's exposure to asbestos is below the PELs.  3. If the limits are exceeded, a compliance program shall be undertaken.  <b>Personal monitoring</b>  4. Samples shall be collected from within the breathing zone of the employees, on membrane filters of 0.8 µm porosity mounted in an open-face filter holder. Both TWA concentrations and ceiling concentrations shall be taken.  5. Sampling shall be done at intervals no greater than 6 mos for employees who may be exposed to asbestos in excess of the PEL.	<b>Protective clothing</b>  1. The employer shall provide, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos which exceed the ceiling level.  2. Change rooms shall be provided at any fixed place of employment where concentrations of asbestos exceed the PELs.  3. Two separate lockers or containers shall be provided for each employee so as to prevent contamination of street clothes from work clothes.  4. Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers and labeled properly.  5. Laundry personnel shall be informed of how to handle asbestos-	1. Every employer shall maintain records of any personal or environmental monitoring for a period of at least 20 yrs.  2. Shall be available to the Assistant Sec. of Labor for OSHA, the Director of NIOSH, and to authorized representatives of either.  3. Shall be provided upon request to employees and DR.  4. Any employee found to have been exposed to concentrations of asbestos in excess of the limits shall be notified in writing as soon as practicable, but not later than 5 days of the finding. The employee shall also be timely notified of the corrective action being taken.	Yes	Yes	Yes		

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>TRAINING</b></p>	<p><b>LABELLING</b></p>	<p><b>POSTING</b></p>	<p><b>PRACTICES WORK</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>Asbestos</b> (continued)</p>		<p><b>Environmental monitoring</b></p> <p>6. Affected employees, or their DR, shall be given a reasonable opportunity to observe any monitoring required and shall have access to the records thereof.</p>	<p>contaminated clothing so as to prevent the release of airborne asbestos fibers in excess of the exposure limits.</p> <p><b>Respiratory protection</b></p> <p>6. Compliance with the exposure limits may not be achieved by the use of respirators or shift rotation of employees, except during the time period necessary to install engineering controls or institute work practices; in work situations in which the control measures are technically not feasible or feasible to an extent insufficient to reduce concentrations below the limits; or in emergencies.</p> <p>7. Where both respirators and personnel rotation are allowed, and both are practicable, personnel rotation shall be preferred and used.</p> <p>8. Where a respirator is permitted, it shall be selected from among those approved by the Bureau of Mines, or NIOSH.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Asbestos</b> (continued)			9. a. A reusable or single use air purifying respirator or a respirator described in subdivision (b) or (c) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits when the ceiling or the 8-hr TWA airborne concentrations of asbestos fibers are reasonably expected to exceed no more than 10 times those limits.  b. A full facepiece powered air purifying respirator, or a powered air purifying respirator, or a respirator described in subdivision (c) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits when the ceiling or the 8-hr TWA concentrations of asbestos fibers are					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>Asbestos</b> (continued)</p>			<p>reasonably expected to exceed 10 times, but not 100 times, those limits.</p> <p>c. A type "C" continuous flow or pressure-demand, supplied-air respirator shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits when the ceiling or the 8-hr TWA airborne concentrations of asbestos fibers are reasonably expected to exceed 100 times those limits.</p> <p>10. The employer shall establish a respirator program in accordance with the requirements of the American National Standards Practices for Respiratory Protection, ANSI Z88.2-1969.</p> <p>11. No employee shall be assigned to tasks requiring use of respirators if, based upon his most recent examination, the physician determines that</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Asbestos</b> (continued)			the employee will be unable to function normally wearing a respirator, or that the health/safety of the employee or other employees will be impaired by his use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he is able to perform with the same employer; in the same geographical area; and with the same seniority, status, and rate of pay he had just prior to such transfer, if such a different position is available.					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Asphalt fumes (NIOSH 78-106, 9/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, emphasizing:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Skin;</li> <li>Respiratory system.</li> </ol> </li> <li>Physical exam, with attn to abnormalities in:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Skin;</li> <li>Respiratory system.</li> </ol> </li> <li>Ability to use positive or negative pressure respirator.</li> </ol>	<b>As DBRP</b> 1. Same as in A.1 and 2.	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees exposed.</li> <li>Shall be accessible to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>In the event of illness known or suspected to be due to exposure:               <ol style="list-style-type: none"> <li>Physical examination.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Asphalt fumes (NIOSH 78-106, 9/78)	<div>1. Ceiling limit for 15 min: 5.</div> <div>2. Occupational environmental samples shall be collected and analyzed as described in Appendices I and II or III, or by any method shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.</div>	<div>Industrial hygiene survey</div> <div>1. Workers shall not be considered occupationally exposed to asphalt fumes if environmental concentrations, as determined on the basis of an IH survey, do not exceed 1/2 the recommended exposure limit.</div> <div>2. Surveys shall be repeated at least once every 3 yrs and within 30 days after any process change likely to result in an increased concentration of asphalt fumes.</div> <div>Personal monitoring</div> <div>3. If it has been determined that environmental concentrations of asphalt fumes may exceed 1/2 the recommended occupational exposure limit, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to asphalt fumes.</div> <div>4. Routine monitoring of occupationally exposed employees shall be conducted at least annually.</div>	<div>Protective clothing</div> <div>1. Employees shall wear appropriate protective clothing, including gloves, suits, boots, face shields (8 in minimum), or other clothing as needed to prevent eye and skin contact with asphalt fumes.</div> <div>Respiratory protection</div> <div>2. When permissible, respirators shall be selected in accordance with Table I-1.</div> <div>3. When a SCBA is used in concentrations of greater than 50 mg/m<sup>3</sup>, standby workers with suitable rescue and communications equipment must be present.</div> <div>Hygiene practices</div> <div>4. Sanitation measures specified.</div>	<div>1. Records of all IH surveys shall be kept.</div> <div>2. Employers or their successors shall keep records of environmental monitoring for each employee for at least 30 yrs after the individual's employment has ended.</div> <div>3. These records shall include the name and SSN of the employee being monitored, duties and job locations within the worksite, dates of measurements, sampling and analytical methods used and evidence for their accuracy, duration of sampling, number of samples taken, results of analyses, occupational exposure concentrations based on these samples, and any personal protective equipment used by the employee. Records for each employee, indicating date of employment with the company and changes in job assignment, shall be kept for the same 30-yr period.</div> <div>4. The employer shall make these records available upon request to authorized representatives of the</div>	Yes	Yes	Yes	<div>1. Action level = 1/2 the PEL.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Asphalt fumes (continued)</b>		5. If monitoring of an employee's exposure to asphalt fumes reveals an exposure in excess of the recommended ceiling concentration limit, control measures shall be initiated, the exposure of that employee shall be measured at least every 30 days, the employer shall ensure that the employee is protected by a respirator, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental limit. Routine monitoring may then be resumed.		Assistant Sec. of Labor for OSHA or of the Director of NIOSH.  5. Employees or their authorized representatives shall have access to information on their own exposures and shall be given the opportunity to observe any measurement conducted.					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Benzene (1910.1028, 4/79) [Deleted as OSHA Standard, June 19, 1981]	<ol style="list-style-type: none"> <li>For those who are or may be exposed to benzene at or above the action level and those subjected to an emergency.</li> <li>Work history:               <ol style="list-style-type: none"> <li>Past exposure to benzene and other hematologic toxins;</li> <li>Exposure to marrow toxins outside current work situation, including volatile cleansing agents and insecticides.</li> </ol> </li> <li>Family history:               <ol style="list-style-type: none"> <li>Blood dyscrasias, including hematologic neoplasms.</li> </ol> </li> <li>Personal history:               <ol style="list-style-type: none"> <li>Blood dyscrasias, including genetically related hemoglobin alterations, bleeding abnormalities, abnormal function of formed blood elements;</li> <li>Renal dysfunctions;</li> <li>Liver dysfunctions;</li> <li>Drugs routinely taken;</li> <li>Alcohol intake;</li> <li>Systemic infections.</li> </ol> </li> </ol>	At least semi-annually <ol style="list-style-type: none"> <li>Same as in A.</li> <li>Interim work history:               <ol style="list-style-type: none"> <li>New exposure to potential marrow toxins.</li> </ol> </li> <li>Interim personal history:               <ol style="list-style-type: none"> <li>Change in drug/alcohol intake;</li> <li>Change in appearance of physical symptoms related to blood disorders.</li> </ol> </li> <li>Lab tests:               <ol style="list-style-type: none"> <li>Complete blood count as in A.5.a, except vii and viii;</li> <li>Additional tests, as DBRP.</li> </ol> </li> <li>Medical examination, as DBRP, if employee develops signs/symptoms associated with exposure.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer, for each employee subject to medical surveillance.</li> <li>Include name; SSN; a copy of the physician's written opinions; results of all examinations and tests; peripheral blood smear slides of the initial test, the most recent test, and any test demonstrating hematological abnormalities related to benzene exposure; employee medical complaints; a copy of the standard or references to the standard; and a copy of medical and work histories related to exposure to benzene or any other hematologic toxins.</li> <li>Shall be available to the Director and the Assistant Sec., as well as DMR and the employee.</li> </ol>	In an emergency <ol style="list-style-type: none"> <li>Urinary phenol test.</li> <li>If C.1 is 75 mg phenol/l of urine, then provide complete blood count as in A.5.a.i, ii, and iii. This should also be done 1 mo later.</li> <li>If any of the blood tests taken for either A or B indicate abnormal red cell, white cell, or thrombocyte count or hemoglobin level, employee should be referred to a hematologist.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Benzene (1910.1028) [Deleted as OSHA Standard, June 19, 1981]	1. TWA for 8 hrs: (1). 2. Ceiling limit for 15 min: (5).	1. Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to benzene over an 8-hr period. 2. Each employer who has a place of employment where benzene is produced, reacted, released, packaged, repackaged, stored, transported, handled, or used shall monitor each of these workplaces and work operations to accurately determine the airborne concentrations of benzene to which employees may be exposed. 3. If the measurements reveal employee exposure to be below the action level, the measurements need not be repeated. 4. If the measurements reveal employee exposure to be at or in excess of the action level, but below the PELs, the employer shall repeat the monitoring at least quarterly. The employer	<b>Protective clothing</b> 1. Where eye or dermal exposure may occur, the employer shall provide, at no cost to the employee, and assure that the employee wears impermeable protective clothing and equipment to protect the area of the body which may come in contact with liquid benzene. 2. Eye and face protection shall meet the requirements of 1910.133. <b>Respiratory protection</b> 3. Where respiratory protection is required, the employer shall select, provide, and assure the use of respirators. 4. Respirators shall be used during the time period necessary to install or implement feasible engineering controls or work practice controls; during maintenance and repair activities in which controls are not feasible; in work situations where controls are not yet sufficient to reduce exposure to or below	1. The employer shall establish and maintain an accurate record of all measurements required. 2. This record shall include the dates, number, duration, and results of each of the samples taken, including a description of the procedure used to determine representative employee exposures; description of the sampling and analytical methods used; type of respiratory protective devices worn, if any; and name, SSN, and job classification of the employee monitored and all other employees whose exposure the measurement is intended to represent. 3. The employer shall maintain this record for at least 40 yrs or the duration of employment plus 20 yrs, whichever is longer. 4. When the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained. 5. When the employer ceases to do business and there is no successor employer to	Yes	Yes	Yes	1. Standard applies to each place of employment where benzene is produced, reacted, released, packaged, repackaged, stored, transported, handled, or used. 2. Action level = airborne concentration of benzene of 0.5 ppm, over an 8-hr workday.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Benzene (continued)	5. Lab tests: a. Complete blood count, with: i. Red cell count; ii. White cell count with differential; iii. Platelet count; iv. Hematocrit; v. Hemoglobin; vi. Red cell indices (MCV, MCH, MCHC); vii. Serum bilirubin; viii. Reticulocyte count; b. Additional tests, as DBRP.  6. No medical exam is required if the above (2-5) or exposures are OK.		4. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director.  5. At the expiration of the retention period, the em- ployer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzene</b> (continued)		<p>shall continue these quarterly measurements until at least 2 consecutive measurements, taken at least 7 days apart, are below the action level, and thereafter the employer may discontinue monitoring.</p> <p>5. If the measurements reveal employee exposure to be in excess of the PELs, the employer shall repeat the measurements at least monthly. The employer shall continue these monthly measurements until at least 2 consecutive measurements, taken at least 7 days apart, are below the PELs, and thereafter the employer shall monitor at least quarterly.</p> <p>6. Whenever there has been a production, process, personnel, or control change which may result in new or additional exposure to benzene or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to benzene, the employer</p>	<p>the PELs; or in emergencies.</p> <p>5. When permissible, the employer shall select and provide, at no cost to the employee, the appropriate respirator from Table 1, Section g of the standard.</p> <p>6. The employer shall institute a respiratory protection program in accordance with §1910.134(b), (d), (e), and (f).</p> <p>7. The employer shall select respirators from among those approved by NIOSH under the program of 30 CFR Part 11.</p> <p>8. Where air purifying respirators are used, the employer shall replace the canisters or cartridges prior to the expiration of their service life or the end of shift in which they are first used, whichever occurs first.</p> <p>9. Where a cartridge or canister of an air purifying respirator has an end of service life indicator certified by</p>	<p>receive and retain the records, the employer shall transmit these records by mail to the Director.</p> <p>6. At the expiration of the retention period for the records, the employer shall transmit these records by mail to the Director.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzene (continued)</b>		<p>shall repeat the monitoring.</p> <p>7. Whenever spills, leaks, ruptures, or other breakdowns occur, the employer shall repeat monitoring after cleanup or repair has taken place.</p> <p>8. Within 5 working days after the receipt of the measurement results, the employer shall notify each employee in writing of the exposure measurements which represent that employee's exposures.</p> <p>9. Where the results indicate that the employee's exposure exceeds the PELs, the notification shall also include the corrective action being taken or to be taken by the employer to reduce exposure to or below the permissible limit.</p> <p>10. The employer shall provide affected employees, or their DR, an opportunity to observe any measuring or</p>	<p>NIOSH for benzene, the employer may permit its use until such time as the indicator shows the end of the service life.</p> <p>10. The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is properly fitted.</p> <p>11. The employer shall allow each employee who wears a respirator to wash his or her face and respirator facepiece to prevent skin irritation associated with respirator use.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

OBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Benzene (continued)		<p>monitoring of employee exposure to benzene conducted.</p> <p>11. When observation of the measuring or monitoring of employee exposure to benzene requires entry into areas where the use of protective clothing and equipment or respirators is required, the employer shall provide the observer with personal protective clothing and equipment or respirators required to be worn by employees working in the area, assure the use of such clothing and equipment or respirators, and require the observer to comply with all other applicable safety and health procedures.</p> <p>12. Without interfering with the measurement, observers shall be entitled to receive an explanation of the measurement procedures; to observe all steps related to the measurement of airborne concentrations of benzene performed at the place of exposure; and to record the results obtained.</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Benzidine</b> <b>(1910.1010, 11/78)</b>	<ol style="list-style-type: none"> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Decreased immuno-competence;</li> <li>Treatment with steroid or cytotoxic agent;</li> <li>Pregnancy;</li> <li>Cigarette smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including:               <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized personnel and all employees considered for assignment to enter regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzidine (1910.1010)</b>		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where benzidine is manufactured, processed, used, packaged, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where benzidine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in benzidine handling operations involving</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of benzidine in each regulated area; the number of employees in each regulated area during normal operations, including the manner in which benzidine is present in each regulated area.</li> <li>3. Incidents resulting in release of benzidine into any area where employees may be potentially exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an explanation of the procedure used in determining this figure; a</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HH8 - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Benzidine (continued)			<p>transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>description of the area involved, and the extent of known employee exposure; any medical treatment given, or surveillance implemented; an analysis of the circumstances of the incident, and measures taken to avoid further releases.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Benzoyl peroxide (NIOSH 77-166, 6/77)</b>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, emphasizing:               <ol style="list-style-type: none"> <li>a. Skin condition.</li> </ol> </li> <li>2. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin, for evidence of dermatitis.</li> </ol> </li> </ol>	<b>At least every 3 yrs, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam as in A.2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.</li> <li>3. Include environmental exposure records.</li> <li>4. For employees exposed to concentrations at or below the action level, records of preplacement medical examinations shall be also kept for 30 yrs after termination of employment.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzoyl peroxide (NIOSH 77-166, 6/77)</b>	<ol style="list-style-type: none"> <li>1. TWA for 10 hrs: 5.</li> <li>2. Sampling and analysis of airborne benzoyl peroxide shall be performed by the methods described in Appendices I and II, or by other methods at least equivalent in precision and accuracy.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Employers shall conduct an IH survey at locations where benzoyl peroxide is found in the workplace air to determine if there is exposure to airborne benzoyl peroxide at concentrations greater than the PEL.</li> <li>2. Surveys shall be repeated at least annually and within 30 days of any change likely to result in increased concentrations of airborne benzoyl peroxide.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If it has been determined that the concentration exceeds or may exceed the PEL, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed to benzoyl peroxide.</li> <li>4. Source and area monitoring may be used to supplement personal monitoring.</li> <li>5. Each operation in each work area shall be sampled at least once every 6 mos or as otherwise indicated by a PIH.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. The employer shall provide chemical safety goggles, glasses, or face shields (8 in minimum) with goggles and shall ensure that employees wear them during any operation in which benzoyl peroxide may enter the eyes.</li> <li>2. The employer shall provide fire-resistant clothing treated with an antistatic agent to employees using or handling pure benzoyl peroxide. Additional protective clothing shall be worn when needed. The employer shall ensure that precautions are taken to protect personnel who launder clothing contaminated with pure benzoyl peroxide.</li> <li>3. Protective gloves and aprons shall be worn during operations where pure benzoyl peroxide is handled and may contact the skin.</li> <li>4. Measures, such as the wearing of conductive shoes, designed to dissipate static electricity should be required by the employer</li> </ol>	<ol style="list-style-type: none"> <li>1. Maintain IH survey records until the next survey is conducted.</li> <li>2. Environmental monitoring records shall be maintained for at least 30 yrs.</li> <li>3. These records shall include the name of the employee being monitored; duties performed, and job locations within the worksite; dates of measurements; sampling and analytical methods used; the number, duration, and results of samples taken; TWA concentrations estimated from these samples; and the type of personal protection used, if any, by the employee.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>5. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = any work involving handling, storage, use, or manufacturing of benzoyl peroxide at a concentration above the action level.</li> <li>2. Action level = the PEL.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzoyl peroxide (continued)</b>		<p>6. If an employee is found to be exposed to concentrations above the PEL, the exposure of that employee shall be measured weekly, controls initiated, and the employee notified of the exposure and of the controls being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the PEL. Semiannual monitoring may then be resumed.</p>	<p>when large amounts of pure benzoyl peroxide are handled.</p> <p>5. The employer shall ensure that all personal protective devices, including conductive shoes and conductive flooring, are inspected regularly, cleaned, and maintained in working condition.</p> <p><b>Respiratory protection</b></p> <p>6. When use of a respirator is permitted, respirators shall be selected in accordance with Table I-1 and employers shall ensure that employees properly use the respirators provided when wearing respirators is required.</p> <p>7. When an emergency involving benzoyl peroxide requires evacuation, the employees shall leave the area immediately, stopping to put on respirators only if absolutely necessary.</p> <p>8. Respirators shall be easily accessible and employees informed of their location.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>						



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLL TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Benzyl chloride (NIOSH 78-182, 8/78)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on disorders of: <ol style="list-style-type: none"> <li>a. Respiratory system;</li> <li>b. Skin;</li> <li>c. Eyes.</li> </ol> </li> <li>2. Physical exam, with emphasis on: <ol style="list-style-type: none"> <li>a. Respiratory system;</li> <li>b. Skin;</li> <li>c. Eyes.</li> </ol> </li> <li>3. Ability to use positive pressure respirator.</li> <li>4. Clinical tests, including: <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. Pulmonary function (FVC, FEV1.0).</li> </ol> </li> </ol>	<p>At least annually</p> <ol style="list-style-type: none"> <li>1. Interim medical and work histories as in A.1.</li> <li>2. Physical exam as in A.2.</li> <li>3. Clinical tests as in A.4, with exception of the chest X-ray.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS. of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. If irritation or illness associated with exposure: <ol style="list-style-type: none"> <li>a. Appropriate medical services.</li> </ol> </li> </ol> <p>In an emergency</p> <ol style="list-style-type: none"> <li>2. Immediate medical services, with appropriate follow-up medical care.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES	ADDITIONAL INFORMATION
Benzyl chloride (NIOSH 78-182, 8/78)	<ol style="list-style-type: none"> <li>1. Ceiling limit for 15 min: 5.</li> <li>2. Workplace air samples shall be collected and analyzed as described in Appendix I, or by any method shown to be at least equivalent in precision, sensitivity, and accuracy.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Employers shall determine by IH survey whether exposure to airborne benzyl chloride is in excess of the recommended occupational exposure limit.</li> <li>2. Such surveys shall be repeated at least once every 12 mos and within 30 days of any process change likely to result in an increase in the concentration of airborne benzyl chloride.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. When an IH survey demonstrates that the concentration of benzyl chloride exceeds the PEL, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed.</li> <li>4. Source and area monitoring may be used to supplement personal monitoring.</li> <li>5. Each operation shall be sampled at least once every 3 mos or as otherwise indicated by a PIH.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Protective clothing shall be resistant to penetration by, and to the chemical action of, benzyl chloride.</li> <li>2. Additional protection, including gloves, bib-type aprons, boots, or overshoes, shall be provided for, and worn by, each employee wherever there may be direct contact with liquid benzyl chloride.</li> <li>3. Supplied-air hoods or suits resistant to penetration by benzyl chloride shall be worn when entering confined spaces, such as pits or storage tanks.</li> <li>4. In situations where heat stress is likely to occur, supplied-air suits, preferably cooled, are recommended.</li> <li>5. The employer shall ensure that all personal protective clothing is inspected regularly for defects and is maintained in a clean and satisfactory condition. Protective equipment suitable for</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of IH surveys shall be kept.</li> <li>2. Records of environmental monitoring shall be kept for at least 30 yrs.</li> <li>3. These records shall include the dates and times of measurements; duties and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; ceiling concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names.</li> <li>4. These records shall be made available to DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = work in any area where benzyl chloride is manufactured, processed, stored, handled, or used.</li> </ol>

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzyl chloride</b> (continued)		<p>6. If an employee is found to be exposed at a level in excess of the ceiling limit, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that employee exposure no longer exceeds the permissible exposure limit. Quarterly monitoring shall then be resumed.</p>	<p>emergency use shall be located at clearly identified stations outside the work area.</p> <p><b>Eye protection</b></p> <p>6. Safety glasses, chemical safety goggles, or face shields (20 cm minimum) with goggles shall be provided by the employer and shall be worn during any operation in which benzyl chloride may come in contact with the eyes.</p> <p><b>Respiratory protection</b></p> <p>7. When use of a respirator is permitted, it shall be selected in accordance with Table I-1. Employers shall ensure that the employee uses the respirator provided, when necessary.</p> <p>8. The employer shall ensure that respirators are adequately cleaned and maintained and that employees are instructed and drilled, at least annually, in the proper use and testing for leakage of respirators assigned to them.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Benzyl chloride</b> (continued)			9. Respirators shall be easily accessible and employees shall be informed of their location.  <b>Hygiene practices</b> 10. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)	A. PRE-PLACEMENT REQUIREMENT	B. PERIODIC REQUIREMENTS	C. RECORDKEEPING REQUIREMENTS	D. OTHER REQUIREMENTS
BOLD TYPE FOR OSHA STANDARDS	FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Beryllium (NIOSH 72-10268, 6/72)	1. Physical exam, with: a. 14" x 17" chest X-ray; b. Baseline pulmonary function (FVC, FEV1.0); c. Baseline weight.	Annually, except when variance has been granted based on minimal exposure 1. Spirometry, including FVC and FEV1.0. 2. Medical history ques- tionnaire, including: a. Presence and degree of respiratory symptoms, i.e., breathlessness, cough, sputum production, and wheezing. 3. 14" x 17" chest X-ray.	1. Retain 20 yrs for all workers exposed. 2. Department of HHS, DOL physicians, medical con- sultants, and those physicians designated and authorized by the employee shall have access to medical records.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Beryllium (NIOSH 72-10268, 6/72)</b>	1. TWA: 2 µg Be/m <sup>3</sup> .  2. Ceiling concentration for 30 min: 25 µg Be/m <sup>3</sup> .  3. Procedures for sampling, calibration of equipment, and analysis of beryllium samples shall be as provided in Appendices I and II.	1. Breathing-zone samples shall be collected from employees at least quarterly for specific work operations.  2. Samples shall be collected and evaluated as both time-weighted and peak concentration values.  3. The sampling regime shall be every 30 days for work areas where the TWA or ceiling concentration exceeds the PELs.  4. Sampling, monitoring, and recordkeeping require- ments of a 30-day schedule shall be required only until 2 consecutive 30-day sampling periods have resulted in environmental levels which meet the standard.	<b>Protective clothing</b>  1. The employer shall provide each employee except those with minimal exposure with protective clothing, headgear, and shoes when the employee must work with and/or be exposed to beryllium, beryllium compounds, or beryllium containing products.  2. Such clothing may be coveralls or similar full-body protective clothing.  3. Protective shoe covers or work shoes shall be worn during the working hours in areas where there is exposure to beryllium.  4. Resin-impregnated paper or similar protective clothing can be substituted for fabric- type clothing.  5. Protective clothing shall be changed at least each day at the end of each shift.  6. The employer shall provide for maintenance and laundering of soiled protective clothing, which shall be stored,	1. Records shall be maintained for all sampling schedules to include the type of personal protective devices, if any, in use.  2. Workers shall be informed of the periodic results of samplings.	Yes	Yes	Yes	1. No dry sweeping shall be performed.



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Beryllium (continued)</p>			<p>transported, and disposed of in sealed, non-reusable containers and labeled accordingly.</p> <p>7. Dust removal, by blowing or shaking of clothing, shall be prohibited; protective clothing shall be cleaned by power suction (vacuum) prior to removal; removal of contaminated clothing shall be allowed only in the change rooms.</p> <p>8. The employer shall provide laundering controls and inform the employee and any third party which launders contaminated clothing of the potentially harmful effects of exposure to beryllium dust and of safe practices required in the laundering of beryllium-soiled work clothing.</p> <p>9. Workers with minimum beryllium exposure shall be provided laboratory coats, or equivalent protective clothing.</p> <p>10. Clean protective clothing shall be supplied to each worker at least weekly.</p>						

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Beryllium (continued)</p>			<p><b>Respiratory protection</b></p> <p>11. Respirators shall be used at any time the actual or projected level of beryllium will exceed an 8-hr TWA concentration of 2 µg/m<sup>3</sup>. These devices shall not be used as a substitute for proper <i>engineering controls</i>, but are appropriate for necessary periods where excessive atmospheric concentrations result from emergencies or from maintenance or repair.</p> <p>12. If a variance order is granted under provisions of the Occupational Safety and Health Act of 1970 from the PEL, the provisions of this section shall still apply to safeguard workers.</p> <p>13. Reusable half mask air purifying respirators equipped with high efficiency filters shall be used in atmospheres containing not more than 25 µg Be/m<sup>3</sup> for any period of time.</p> <p>14. Reusable full-facepiece air purifying respirators equipped with high</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Beryllium</b> (continued)			<p>efficiency filter shall be used in atmospheres containing not more than 100 µg Be/m<sup>3</sup> for any period of time.</p> <p>15. Powered air purifying respirators equipped with high efficiency filters, operating with positive pressure during the inhalation phase of breathing shall be used in atmospheres containing not more than 1000 µg Be/m<sup>3</sup>. When equipped with a "fume filter," respirators shall be used in atmospheres containing not more than 40 µg Be/m<sup>3</sup>.</p> <p>16. Continuous flow air-line respirators or self-contained breathing units operating in the pressure-demand mode and providing positive pressure during the inhalation phase of breathing, shall be used in atmospheres that exceed 1000 µg Be/m<sup>3</sup>.</p> <p><b>Hygiene practices</b></p> <p>17. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Boron trifluoride (NIOSH 77-122, 12/76)</b>	<ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Respiratory system;</li> <li>b. Pulmonary function (FVC, FEV1.0);</li> <li>c. 14" x 17" post/ant chest X-ray, as DBRP;</li> <li>d. Respiratory difficulties.</li> </ol> </li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after last occupational exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the employee, of the employer, of the Sec. of Labor, and of the Sec. of HHS.</li> </ol>	<b>In an emergency</b> <ol style="list-style-type: none"> <li>1. Immediate first aid, with emphasis on:               <ol style="list-style-type: none"> <li>a. Respiratory tract;</li> <li>b. Skin;</li> <li>c. Eyes.</li> </ol> </li> <li>2. Flush with water if skin or eye contact.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Boron trifluoride (NIOSH 77-122, 12/76)	Not recommended because of the unavailability of adequate monitoring methods.	When an adequate sampling and analytical method is developed the following shall apply:  1. A program of personal monitoring shall be instituted to identify and measure or permit calculation of the exposure of all employees in boron trifluoride work areas.  2. If monitoring reveals that an employee is exposed to more than the PEL, that employee's exposure shall be measured once every 30 days, controls initiated, and the employee informed of his/her exposure. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate exposure no longer exceeds the limit.  3. Monitoring is not required when boron trifluoride is used and stored only in a proper exhaust hood.	<b>Protective clothing</b>  1. Proper impervious protective clothing, including gloves, aprons, suits, boots, goggles, and face shields, shall be worn as needed to prevent skin and eye contact with boron trifluoride.  <b>Respiratory protection</b>  2. The use of respirators to limit exposure is permitted only during the time necessary to install or test the required engineering controls; during operations such as nonroutine maintenance or repair activities which may cause exposures at elevated concentrations; during emergencies when air concentrations of boron trifluoride are sufficient to form a visible mist in the employee's breathing zone; and during the initial charging of a pressurized system with boron trifluoride gas when unsuspected leaks may become evident.  3. Only supplied-air positive-pressure respirators shall be provided for work in or entry into boron	1. Until adequate environmental monitoring methods are developed, records shall consist of a description of job functions involving exposure to boron trifluoride and use of any personal protective devices.  2. Records shall be maintained for 20 yrs.  3. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = work in areas where boron trifluoride is manufactured, used, or handled, or is evolved as a result of chemical processes.



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Boron trifluoride (continued)			<p>trifluoride contaminated areas.</p> <p>4. For escape purposes only, a full-facepiece gas mask with a combination acid-gas canister and high-efficiency (penetration less than 0.03% against a 0.3-µm dioctyl phthalate aerosol) filter may be used.</p> <p><b>Hygiene practices</b></p> <p>5. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Cadmium (NIOSH 76-192, 8/76)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive work and medical histories.</li> <li>2. Physical exam, with: <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. FVC and FEV1.0;</li> <li>c. Blood pressure;</li> <li>d. Blood analysis (urea nitrogen count, SGOT, and other liver enzymes);</li> <li>e. Urinalysis (microscopic exam, sugar determination, quantitative protein determination, specific gravity, urine cadmium levels).</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam, with: <ol style="list-style-type: none"> <li>a. Urinalysis (quantitative protein determination every 4 mos—check cadmium level to see if <math>&gt;10 \mu\text{g}/\ell</math>;</li> <li>b. FVC, FEV1.0;</li> <li>c. BP;</li> <li>d. Chest X-ray, as DBRP;</li> <li>e. Blood analysis;</li> <li>f. Palpation of prostate in male workers <math>&gt;40</math> yrs old.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after last occupational exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Cadmium (NIOSH 76-192, 8/76)	<p>1. TWA: 40 µg Cd/m<sup>3</sup>.</p> <p>2. Ceiling limit for 15 min: 200 µg Cd/m<sup>3</sup>.</p> <p>3. Sampling in the work environment shall be performed by the method provided in Appendix I, or by a method with at least equivalent efficiency. Samples shall be analyzed by the method provided in Appendix II, or by a method shown to be at least equivalent in precision and sensitivity.</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Workers are not considered to be occupationally exposed to cadmium if environmental concentrations, as determined on the basis of an IH survey, do not exceed 1/2 the recommended TWA, or if there is no operation, storage, or handling of cadmium in any form or contamination of workplace air from other sources.</p> <p>2. Repeat IH surveys at least every 3 yrs and within 30 days after any process or operating change likely to result in increases of airborne concentrations of cadmium.</p> <p><b>Personal monitoring</b></p> <p>3. Where occupational exposure exists, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to cadmium.</p> <p>4. This sampling and analysis shall be conducted every 3 mos on at least 25% of the workers so that each</p>	<p><b>Respiratory protection</b></p> <p>1. Respirators are permitted only during installation and testing of controls; during performance of nonroutine maintenance or repair; during single operations; or during emergencies.</p> <p>2. When permissible, respirators shall be selected in accordance with Table I-1 and employers shall ensure that employees use the respirators provided in a proper manner when wearing of respirators is required.</p> <p>3. The employer shall establish and conduct a program of cleaning, sanitizing, inspecting, maintaining, repairing, and storing of respirators, to ensure that employees are provided with clean respirators that are in good operating condition.</p> <p>4. The employer shall periodically monitor the use of respirators to ensure that the proper type of respirator is worn, to evaluate the effectiveness of the respiratory protection program, and to</p>	<p>1. Retain IH survey records until the next survey is completed.</p> <p>2. Environmental monitoring records shall be maintained for at least 20 yrs.</p> <p>3. These records shall include methods of sampling and analysis used, types of respiratory protection used, and TWA and ceiling concentrations found.</p> <p>4. Each employee shall be able to obtain information on his or her own environmental exposures.</p> <p>5. Environmental records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = exposure to cadmium at concentrations greater than the action level.</p> <p>2. Action level = 1/2 the TWA.</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Cadmium (continued)</b>		<p>worker's exposure is measured at least every yr; this frequency and fraction of employees sampled may be different if so directed by a PIH.</p> <p>5. If monitoring of any worker shows exposure in excess of either PEL, additional monitoring shall be promptly initiated.</p> <p>6. If confirmed, controls shall be instituted as soon as possible and affected employees advised of their exposures and notified of the control measures being implemented.</p> <p>7. Monitoring of these employees' exposures shall be conducted at least as often as every 30 days and shall continue until 2 successive samplings at least 1 wk apart confirm that exposure no longer exceeds recommended limits. Normal monitoring may then be resumed.</p>	<p>eliminate any deficiencies in use and care of respirators.</p> <p><b>Hygiene practices</b></p> <p>5. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Carbaryl (NIOSH 77-107, 9/76)</p>	<ol style="list-style-type: none"> <li>1. Medical and work histories, looking for: <ol style="list-style-type: none"> <li>a. Frequent headaches, dizziness, tightness in chest, dimness of vision, difficulty in focusing eyes;</li> <li>b. Glaucoma;</li> <li>c. Cardiovascular disease;</li> <li>d. Hepatic diseases;</li> <li>e. Renal diseases;</li> <li>f. CNS diseases;</li> <li>g. Use of anticholinergic drugs;</li> <li>h. Pre-exposure: Determine baseline erythrocyte cholinesterase activity.</li> </ol> </li> <li>2. Physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Cardiovascular symptoms;</li> <li>b. Central nervous system;</li> <li>c. Vision;</li> <li>d. Kidneys;</li> <li>e. Complete urinalysis, including a microscopic exam.</li> </ol> </li> </ol>	<p>Annually, or as DBRP</p> <ol style="list-style-type: none"> <li>1. Medical and work interim histories as in A.1.a.</li> <li>2. Physical exam as in A.2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>1. First aid (see Appendix III of Reference).</li> </ol> <p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>2. Appropriate medical services.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Carbaryl (NIOSH 77-107, 9/78)	1. TWA: 5.  2. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.	Industrial hygiene survey  1. Workers are not considered to have occupational exposure to carbaryl if airborne concentrations, as determined by an IH survey, do not exceed 1/2 the recommended TWA environmental limit, i.e., action level.  2. Surveys shall be repeated at least once every yr and within 30 days after any process change likely to increase the airborne concentration of carbaryl.  Personal monitoring  3. If the IH survey indicates that airborne concentrations of carbaryl exceed the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees who are occupationally exposed to carbaryl.  4. Interim monitoring of employee exposure shall be conducted at least every 6 mos.  5. If monitoring shows an employee's exposure to be above the recommended PEL, the exposure of that	Protective clothing  1. Any employee whose work involves likely exposure of the skin to carbaryl or carbaryl formulations, e.g., mixing or formulating, shall wear full-body coveralls or the equivalent; impervious gloves, i.e., highly resistant to the penetration of carbaryl; impervious footwear; and, when there is danger of carbaryl coming in contact with the eyes, goggles or a face shield.  2. Employees working as flaggers in the aerial application of carbaryl shall be provided with, and required to wear, full-body coveralls or waterproof rainsuits, protective head coverings, impervious gloves, and impervious footwear.  Eye protection  3. Safety goggles and face shields, when required, shall conform to 29 CFR 1910.133.  Respiratory protection  4. Any employee applying carbaryl by aircraft shall be provided with, and	1. Maintain records of IH surveys.  2. Environmental records shall be maintained for 5 yrs.  3. Shall include sampling and analytical methods, types of respiratory protective devices used, and TWA concentrations found.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. These records shall be available to the DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne carbaryl at concentrations greater than the action level.  2. Action level = 1/2 the TWA.	



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Carbaryl (continued)		employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of the exposure and the control measures being implemented to correct the situation. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the PEL. Semiannual monitoring may then be resumed.	<p>required to carry in the aircraft, a respirator as specified in Table I-1.</p> <p>5. Employees working as flaggers shall wear appropriate respirators as specified in Table I-1 when exposure to an airborne carbaryl concentration above the PEL is likely to occur.</p> <p>6. The employer shall provide and ensure employee use of respirators approved under the provisions of 30 CFR 11 and in accordance with Table I-1, except during all agricultural applications of carbaryl in which the dust- or spray-applicator nozzle is directed upward when a chin-style respirator equipped with a full-face gas mask pesticide filter and canister shall be provided regardless of the environmental carbaryl concentration.</p> <p>7. Canisters shall be discarded and replaced with fresh canisters in accord with the manufacturer's recommendations or if the odor of the insecticide breaks through. Unused</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Carbaryl</b> <b>(continued)</b>			canisters shall be discarded and replaced when seals are broken, after 3 yrs if seals are unbroken, or as recommended by the manufacturer.  <b>Hygiene practices</b> 8. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Carbon black (NIOSH 78-204, 9/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, emphasizing: <ol style="list-style-type: none"> <li>Respiratory system;</li> <li>Heart;</li> <li>Skin;</li> <li>Previous exposures to potential respiratory and skin irritants and pulmonary carcinogens;</li> <li>Smoking and tobacco histories.</li> </ol> </li> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Upper and lower respiratory tract;</li> <li>Heart;</li> <li>Skin;</li> <li>Mucous membranes of the oral cavity;</li> <li>Any pretumorous and tumorous lesions on the skin and membranes.</li> </ol> </li> <li>Clinical tests, including: <ol style="list-style-type: none"> <li>35 x 42 cm post/ant and lateral chest X-ray;</li> <li>Pulmonary function tests (FVC, FEV1.0, ECG, sputum cytology).</li> </ol> </li> <li>Ability to use positive and negative pressure respirators.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Interim medical and work histories.</li> <li>Physical exam as in A.2.</li> <li>Clinical tests as in A.3, with the exception of the X-ray, which will be provided as follows: <ol style="list-style-type: none"> <li><b>Annually</b> if exposed to CB &gt; 0.1% PAHs;</li> <li><b>Triennially</b> if exposed to CB &lt; 0.1% PAHs.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after the last occupational exposure.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Carbon black (NIOSH 78-204, 9/78)	1. TWA: 3.5.  2. TWA for poly- cyclic aromatic hydrocarbons (PAHs): 0.1. If carbon black contains PAH at concen- trations greater than 0.1%, the PAH limit shall be used.  3. Environmental samples shall be collected and analyzed as described in Appendices I and II, or by any method at least equivalent in accuracy, precision, and sensitivity.	<b>Industrial hygiene survey</b>  1. Each employer who manufactures or uses carbon black shall determine by an IH survey if there is occupational exposure to it.  2. Surveys shall be repeated at least annually and within 30 days of any process change likely to result in an increase in the concentrations of airborne carbon black, airborne PAHs, or the concentration of PAHs in the bulk carbon black.  <b>Personal monitoring</b>  3. If there is occupational exposure to carbon black, a program of personal monitoring shall be instituted to measure the exposures of all employees.  4. Each operation in each work area shall be sampled at least once every 6 mos.  5. If an employee is found to be exposed to carbon black or PAHs in excess of the PELs, and this is con- firmed, the employee shall be notified of the extent of the exposure and of the control measures being	<b>Protective clothing</b>  1. The employer shall provide and require employees working with carbon black to wear appropriate full- body clothing, with elastic cuffs at the wrists and ankles, gloves, and shoes, which are resistant to penetration by carbon black to minimize skin contact.  2. The employer shall ensure that, at the conclusion of the workshift, all clothing is removed only in the change rooms.  3. The employer shall ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of is placed in a closed container in the change room.  <b>Eye protection</b>  4. Chemical safety goggles shall be provided to employees experiencing eye irritation during exposure.  <b>Respiratory protection</b>  5. When permissible, respirators shall be selected in accordance with Table I-1.	1. Records of IH surveys shall be maintained for at least 30 yrs.  2. Records of workplace environmental monitoring shall be kept for at least 30 yrs.  3. These records shall include the dates and times of measurements, job function and location of the employee within the worksite, methods of sampling and analysis used, types of respiratory protection in use at the time of sampling, TWA concentrations found, and identification of the exposed employees.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = any work involving exposure to carbon black at a concentration greater than 1/2 the PEL.  2. Treat as a suspect carcinogen if PAHs exceed 0.1%.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Carbon black (continued)</b>		implemented. Controls shall be initiated promptly. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate the employee's exposure has been effectively reduced. Routine monitoring may then be resumed.	6. The employer shall ensure that employees use required respiratory protective equipment.  7. The employer shall ensure that respirators are adequately cleaned, maintained, and stored in a dust free condition and that employees are instructed and drilled at least annually in the proper use, fit, and testing for leakage of respirator assigned to them.  <b>Hygiene practices</b> 8. Sanitation measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Carbon dioxide (NIOSH 76-194, 8/76)	1. Medical and work histories. 2. Medical exam.	<b>As DBRP</b> 1. Same as in A.	1. Retain 1 yr after termination of employment for all employees receiving medical attention. 2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, and of the employee.	<b>In an emergency or for overexposure</b> 1. Prompt first aid.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Carbon dioxide (NIOSH 76-194, 8/76)</b>	1. TWA: ~18,000 (10,000). 2. Ceiling limit for 10 min: ~54,000 (30,000). 3. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b> 1. Workers shall not be considered to have occupational exposure to carbon dioxide if environmental concentrations, as determined on the basis of an IH survey, do not exceed the TWA. 2. Surveys shall be repeated at least once every 3 yrs and within 30 days after any process change likely to result in an increase of airborne carbon dioxide concentrations. <b>Personal monitoring</b> 3. If it has been decided that carbon dioxide environmental concentrations may exceed the limit, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to carbon dioxide. 4. Routine monitoring of employee exposures shall be conducted at least annually. 5. If monitoring of an employee's exposure to carbon dioxide reveals an exposure in excess of the	<b>Protective clothing</b> 1. Employees shall wear appropriate protective clothing, including gloves, aprons, suits, boots, face shields, or other clothing resistant to temperatures at or lower than 109 F below zero, as needed to prevent burns from frostbite as a result of more than momentary skin contact with solid carbon dioxide. <b>Respiratory protection</b> 2. When respirators are permitted and employees exposed, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided. 3. Where an emergency may develop which could result in employee exposure to carbon dioxide in excess of the PELs or exposure to an oxygen-deficient atmosphere, or both, the employer shall provide respiratory protection as listed in Table I-1. 4. When a self-contained breathing apparatus or combination supplied-air respirator with auxiliary air	1. Records of IH surveys shall be maintained. 2. Sampling records shall be maintained for at least 1 yr after the employee's termination. 3. Shall indicate the type of personal protective devices, if any, in use at the time of sampling. 4. Each employee shall be able to obtain information on his or her own environmental exposures. 5. Records shall be provided upon request to authorized representatives of the Sec. of Labor, or of the Sec. of HHS, or upon the request of a former employee.	Yes	Yes	Yes	1. Occupational exposure = exposure at concentrations greater than the TWA. 2. Overexposure = exposure at a concentration sufficient to produce signs of respiratory difficulty or CNS effects.

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Carbon dioxide (continued)</b>		recommended TWA or ceiling environmental limit, the exposure of that employee shall be measured at least every 30 days, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended PELs; routine monitoring may then be resumed.	tank is used in atmospheres with carbon dioxide concentrations in excess of 150,000 ppm (15%), standby persons with suitable rescue equipment must be present.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Carbon disulfide (NIOSH 77-156, 5/77)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>Cardiovascular system;</li> <li>Reproductive system;</li> <li>Medicine being taken.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Neurologic function;</li> <li>Cardiovascular evaluation (ECG);</li> <li>Urinalysis.</li> </ol> </li> <li>Ability to use positive and negative pressure respirators.</li> </ol>	<b>Annually</b> <ol style="list-style-type: none"> <li>Medical and work histories.</li> <li>As in A.2, with special attn to:               <ol style="list-style-type: none"> <li>Behavioral and psychological changes.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees involved in manufacturing, processing, or handling carbon disulfide, or otherwise exposed.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Carbon disulfide (NIOSH 77-156, 5/77)	1. TWA: 3 (1).  2. Ceiling limit for 15 min: 30 (10).  3. Procedures for collection and analysis of workplace air shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b>  1. Employers shall determine, by an IH survey at each location where carbon disulfide is released into the workplace air, whether employee exposures may be above 1/2 the TWA.  2. Surveys shall be repeated at least annually and within 30 days after any process change likely to result in increased airborne carbon disulfide concentrations.  3. In those yrs with no scheduled surveys, employers shall conduct semiannual sampling (area and personal monitoring) to determine employee exposure.  <b>Personal monitoring</b>  4. If it has been determined that the environmental concentration of carbon disulfide might exceed 1/2 the recommended occupational exposure limit, i.e., 0.5 ppm as a TWA concentration, a program of personal monitoring shall be initiated to determine the	<b>Protective clothing</b>  1. Employers shall provide protective clothing and shall ensure that employees use appropriate skin protection when contact with liquid carbon disulfide is possible.  2. Synthetic rubber gloves shall be provided, and employees should be cautioned not to allow their gloved hands to remain immersed in carbon disulfide for extended periods. Other glove materials of comparable effectiveness may also be used.  <b>Eye protection</b>  3. Face shields (8 in minimum) with goggles shall be worn by employees working with liquid carbon disulfide wherever splashes are likely to occur.  <b>Respiratory protection</b>  4. When a respirator is permitted, it shall be selected in accordance with the specifications in Tables I-1 and I-2.  5. Employers shall ensure that employees use required	1. Records of IH surveys shall be kept.  2. Records of environmental monitoring shall be maintained for at least 30 yrs after the termination of employment.  3. These records shall include the name of the employee being monitored, duties and job locations within the worksite, dates of measurements, sampling and analytical methods used and evidence of their accuracy, duration of sampling, number of samples taken and results of analysis of TWA concentration determinations based on these samples, and personal protective equipment in use by the employee.  4. Records for each employee, indicating date of employment with the company and changes in job assignment, shall be kept for the same 30-yr duration.  5. The employer shall make these records available on request to authorized representatives of the	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne carbon disulfide at or above 1/2 the TWA or contact with skin or eyes of the liquid.  2. Action level = 1/2 the PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Carbon disulfide (continued)</p>		<p>exposure of each employee occupationally exposed to carbon disulfide.</p> <ol style="list-style-type: none"> <li>Source and area monitoring may be used to supplement personal monitoring.</li> <li>If an employee is found to be exposed to a concentration of carbon disulfide above 1/2 the recommended TWA occupational exposure limit, the exposure of that employee shall be monitored at least once every 3 mos.</li> <li>If an employee is found to be exposed at or above the recommended TWA concentration limit, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended occupational exposure limit; quarterly or less frequent monitoring may then be resumed.</li> </ol>	<p>respiratory protective equipment.</p> <ol style="list-style-type: none"> <li>Emergency equipment shall be readily available to the work area and shall be adequate to permit all employees to escape safely from the area.</li> <li>Protective equipment suitable for emergency entry shall be located at clearly identified stations outside the area of possible occupational exposure.</li> </ol> <p><b>Hygiene practices</b></p> <ol style="list-style-type: none"> <li>Sanitation measures specified.</li> </ol>	<p>Assistant Sec. of Labor for OSHA and of the Director of NIOSH.</p> <ol style="list-style-type: none"> <li>Employees, former employees, or their authorized representatives shall have access to information on the occupational exposures of the employee or former employee.</li> <li>The employee or the employee's representative shall be given the opportunity to observe any measurement conducted. Any observer shall have the right to receive an explanation of the procedures used, the results of the measurement, and the measuring of the results for human health and safety.</li> </ol>				



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Carbon monoxide (NIOSH 73-11000, 1972)	1. Physical exam, with attn to: a. Cardiovascular system.	Not specified 1. Same as in A.	No requirements specified.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Carbon monoxide (NIOSH 73-11000, 1972)</p>	<p>1. TWA: (35). As measured by a portable, direct reading, hopcalite-type CO meter calibrated against known concentrations of CO, or with gas detector tube units certified under Title 42 of the Code of Federal Regulations, Part 84.</p> <p>2. Ceiling limit: (200).</p> <p>3. Procedures for calibration of equipment, sampling, and analysis of CO samples shall be followed as provided in Appendix I.</p>	<p>1. Employers shall monitor environmental exposure of employees to CO as follows: personal exposure breathing zone samples shall be collected, in accordance with procedures specified in Appendix I, in all workplaces where employees are significantly exposed to CO. Samples shall be collected and evaluated as both TWA and ceiling concentration values.</p> <p>2. Frequency of monitoring should be at least annually. It is recognized that more frequent monitoring may be indicated in certain circumstances depending upon the nature of the process, the rate of production, the effectiveness of control measurements, the time of day, and seasonal variation; however, more frequent monitoring requirements cannot be recommended until there are extensive studies of specific operations in industry.</p>	<p><b>Respiratory protection</b></p> <p>1. In the event of an emergency or when a variance has been allowed and the use of respiratory protective equipment authorized by the Sec. of Labor, the employer shall provide and ensure that the employee wears, as appropriate, one of the following respiratory protective devices approved by NIOSH or the Bureau of Mines as provided in Part 11 of Title 30, Code of Federal Regulations:</p> <p>a. Type N Gas Mask (Emergency Situation): For entry into or escape from an environment containing not over 20,000 ppm, which is not deficient in oxygen, for a total exposure period of not more than 30 min.</p> <p>b. Demand Type Self-Contained Breathing Apparatus (Variance Situation): For work in atmospheres containing not over 5,000 ppm carbon monoxide.</p>	<p>1. Every employer shall maintain records of any personal or environmental monitoring required by the document.</p> <p>2. Records shall be maintained for a period of at least 3 yrs.</p> <p>3. Shall be available upon request to the Assistant Sec. of Labor for OSHA, the Director of NIOSH, and to authorized representatives of either.</p> <p>4. Each employee and former employee shall have reasonable access to any record required to be maintained which indicates the employee's own exposure to CO.</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Carbon monoxide (continued)</b>		3. Blood analysis for COHb, as specified in Appendix II, shall be performed on all persons employed in work areas when, in the judgment of the OSHA PIH, biologic standards are needed to evaluate borderline exposure to CO.  4. Determination of the CO concentration for border-line exposure, as judged by the OSHA PIH, shall be accomplished by continuous monitoring of the workplace environment. Such continuous monitoring shall be accomplished by means of monitoring equipment capable of determining the CO concentration in the workplace environment within 5% of the actual value.  5. Affected employees, or their DR, shall be given a reasonable opportunity to observe any monitoring.	c. Pressure Demand Type Self-Contained Breathing Apparatus (Variance Situation): For work in atmospheres containing up to 100% CO.  d. Fire Fighting Applications: A demand or pressure demand type self-contained breathing apparatus.  2. All respiratory protective equipment shall be selected so as to ensure satisfactory facepiece fit.  3. Each user shall be instructed and tested in the proper use of respiratory protective devices and each such device shall be used and maintained in accordance with the provisions of the American National Standard Practices for Respiratory Protection ANSI Z-88.2, 1969.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Carbon tetrachloride (NIOSH 76-133, 6/76)	<ol style="list-style-type: none"> <li>1. Medical and work histories, including:               <ol style="list-style-type: none"> <li>a. Nausea, vomiting, visual disturbances;</li> <li>b. Use of alcohol and barbiturates.</li> </ol> </li> <li>2. Medical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Kidneys;</li> <li>b. Eyes (black, white, and color vision fields);</li> <li>c. Liver function.</li> </ol> </li> <li>3. Use of a respirator.</li> </ol>	<b>Annually, or as DBRP</b> 1. Same as in A.	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termi- nation of employment for persons employed in work involving exposure to carbon tetrachloride.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Carbon tetrachloride</b> (NIOSH 76-133, 6/76)	<ol style="list-style-type: none"> <li>1. Ceiling limit for 1 hr: 12.6 (2).</li> <li>2. Procedures for collection and analysis of carbon tetrachloride in air shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. In any workplace where carbon tetrachloride is handled or processed, surveys shall be repeated semiannually.</li> <li>2. Where there is occupational exposure to carbon tetrachloride, samples representative of the exposure in the breathing zone of employees shall be collected by personal samplers.</li> <li>3. A reevaluation of the exposure of employees to carbon tetrachloride shall be made within 30 days after installation of a new process or process change.</li> <li>4. A reevaluation of employee exposure to carbon tetrachloride shall be repeated at 1-wk intervals when the airborne concentration has been found to exceed the recommended workplace environmental limit. In such cases, suitable controls shall be instituted and monitoring shall continue at 1-wk intervals until 3 consecutive surveys indicate the adequacy of controls.</li> </ol>	<b>Protective clothing</b> <ol style="list-style-type: none"> <li>1. Coveralls or other full-body protective clothing shall be worn in areas where there is occupational exposure to carbon tetrachloride. Protective clothing shall be changed at least daily at the end of the shift and more frequently if it should become grossly contaminated.</li> <li>2. Impervious gloves, aprons, and footwear shall be worn at operations where carbon tetrachloride may contact the skin.</li> <li>3. Work clothing may not be taken home by employees. The employer shall provide for maintenance and laundering of protective clothing.</li> <li>4. The employer shall ensure that precautions necessary to protect laundry personnel are taken while soiled protective clothing is being laundered.</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of all sampling and analysis of carbon tetrachloride and of medical examinations shall be maintained for at least 30 yrs after the individual's employment is terminated.</li> <li>2. Records shall indicate the details of the type of personal protective devices, if any, in use at the time of sampling, and the methods of sampling and analysis used.</li> <li>3. Each employee shall be able to obtain information on his or her own environmental exposure.</li> <li>4. If the employer who has or has had employees with occupational exposure to carbon tetrachloride ceases business without a successor, he shall forward their records by registered mail to the Director, NIOSH.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to carbon tetrachloride in any establishment where it is used, manufactured, or stored.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Carbon tetrachloride (continued)</p>			<p><b>Eye protection</b></p> <p>5. Eye protective devices shall be provided by the employer and used by the employees where contact of carbon tetrachloride with eyes is likely.</p> <p>6. Unless eye protection is afforded by a respirator hood or facepiece, protective goggles or a face shield shall be worn at operations where there is danger of contact of the eyes with wet materials containing carbon tetrachloride because of spills, splashes, or excessive vapors in the air.</p> <p><b>Respiratory protection</b></p> <p>7. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided anytime the concentration of carbon tetrachloride exceeds the PEL.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Carbon tetrachloride (continued)</p>			<p>8. Where an emergency may develop which could result in employee injury from carbon tetrachloride, the employer shall provide an escape device as listed in Table I-1.</p> <p>9. The employer shall ensure that all personal protective devices are inspected regularly and maintained in clean and satisfactory working condition.</p> <p>10. The employer shall ensure that carbon tetrachloride is not discharged into municipal waste treatment systems or the community air.</p> <p>Hygiene practices</p> <p>11. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Chlorine (NIOSH 76-170, 5/76)	<ol style="list-style-type: none"> <li>1. Medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Cardiac disease;</li> <li>b. Bronchitis;</li> <li>c. Tuberculosis;</li> <li>d. Pulmonary abscesses;</li> <li>e. Chronic respiratory diseases.</li> </ol> </li> <li>2. Physical exam with olfactory deficiency tests.</li> <li>3. 14" x 17" post/ant chest X-ray.</li> <li>4. Use of respirators.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Refer worker to physician if exposed to high concentration, or exhibits signs/ symptoms of respira- tory tract irritation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after termination of employment for all workers subject to exposure.</li> <li>2. Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> <li>3. Include occupational exposure and accident records.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer worker to physician if exposed to high concen- tration, or exhibits signs/ symptoms of respiratory tract irritation.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Chlorine (NIOSH 78-170, 5/76)</p>	<ol style="list-style-type: none"> <li>1. Ceiling limit for 15 min: (0.5).</li> <li>2. Procedures for sampling, calibration of equipment, and analysis of chlorine samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Workers will not be considered to have occupational exposure to chlorine if environmental concentrations, as determined on the basis of a PIH survey, do not exceed 1/2 of the recommended ceiling concentration (i.e., action level).</li> <li>2. Surveys shall be repeated at least once every 3 yrs and within 30 days after any process change likely to result in increases of airborne concentrations of chlorine.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. A program of personal monitoring shall be instituted to identify and measure or permit calculation of the exposure of all employees who are occupationally exposed to chlorine.</li> <li>4. Monitoring of employee exposure to airborne concentrations of chlorine shall be conducted at least every 6 mos.</li> <li>5. If monitoring of an employee's exposure to</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Personnel performing nonroutine operations where escape of liquid chlorine occurs or emergency operations involving escaping liquid chlorine should wear 1-piece suits which are impervious to chlorine and sealed at the ankles, wrists, and around the face. The suits shall be ventilated with supplied air, or stay time in the work area shall be limited with due consideration of the heat stress factors involved. Impervious gloves and boots should also be worn. Such protective clothing shall be kept readily available for emergencies.</li> <li>2. Impervious gloves shall be worn by persons connecting or disconnecting cylinders of chlorine.</li> <li>3. The employer shall supply and maintain all protective clothing in a clean, sanitary, and usable condition.</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of IH surveys shall be maintained.</li> <li>2. Environmental monitoring records shall also be maintained and shall include sampling and analytical methods, types of respiratory protective devices used, and ceiling concentrations found.</li> <li>3. Each employee shall be able to obtain information on his or her own environmental exposures, and records of such data shall be included in his medical records.</li> <li>4. Pertinent records of required medical examinations, records of occupational accidents, and records of environmental exposures within the workplace, shall be maintained for 5 yrs after the worker's employment has ended.</li> <li>5. Shall be available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to concentrations of chlorine at or above 1/2 the PEL.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G P O S T I N G</b>	<b>P R A C T I C E S W O R K</b>	<b>ADDITIONAL INFORMATION</b>
Chlorine (continued)		<p>chlorine reveals that he is exposed at concentrations in excess of the recommended environmental limit, the exposure of that employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of his exposure and the control measures being implemented to correct the situation. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the PEL. Semiannual monitoring may then be resumed.</p>	<p><b>Eye protection</b></p> <p>4. Personnel working with, or exposed to, liquid or gaseous chlorine containers or systems where chlorine contact with the eyes can occur shall have eye protection. Unless eye protection is afforded by a respirator hood or facepiece, chemical goggles and face shields shall be worn.</p> <p><b>Respiratory protection</b></p> <p>5. The employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>6. Each indoor area required to be posted shall have emergency protective devices readily available in nearby locations which do not require entry into a contaminated atmosphere for access. Certain outdoor locations may be exempted from this requirement depending upon such factors as chlorine capacity, accessibility to facility, nearness to other occupied locations, and ease of evacuation. A decision regarding an exemption</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Chlorine (continued)			<p>shall be made by an OSHA compliance officer. Respiratory protective devices provided shall consist of at least 2 self-contained breathing apparatus as described in Table I-1.</p> <p>7. Canisters shall be discarded after use or whenever an odor or taste is detected, and replaced with fresh canisters. Unused canisters shall be discarded and replaced when the seal is broken or when the shelf life recommended by the manufacturer ends.</p> <p><b>Hygiene practices</b></p> <p>8. Sanitation measures specified.</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Chloroform (NIOSH 75-114, 12/74)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>Gastrointestinal symptoms;</li> <li>Mental status;</li> <li>Alcohol consumption.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Cardiac rhythm;</li> <li>Liver function;</li> <li>Kidney function;</li> <li>Urinalysis.</li> </ol> </li> <li>Ability to use negative or positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> 1. Same as in A.	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all persons employed in work involving exposure to chloroform.</li> <li>Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Chloroform</b> (NIOSH 75-114, 12/74)</p>	<ol style="list-style-type: none"> <li>1. Ceiling limit for 1 hr: 9.78 (2).</li> <li>2. Procedures for collection and analysis of chloroform in air shall be as provided in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. In any workplace where chloroform is handled or processed, an IH survey shall be repeated semiannually.</li> <li>2. In areas where there is occupational exposure to chloroform, workplace environmental monitoring shall be instituted.</li> <li>3. In all monitoring, samples representative of the exposure in the breathing zone of employees shall be collected by personal samplers.</li> <li>4. An adequate number of samples shall be taken in order to determine the occupational exposure of each employee.</li> <li>5. A reevaluation of the exposure of employees to chloroform shall be made within 30 days after installation of a new process or process change.</li> <li>6. A reevaluation of employee exposure to chloroform shall be repeated at 1-wk intervals when the airborne concentration has been found to exceed the recommended workplace</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Coveralls or other full-body protective clothing shall be worn in areas where there is occupational exposure to chloroform. Protective clothing shall be changed at least daily at the end of the shift and more frequently if it should become grossly contaminated.</li> <li>2. Impervious gloves, aprons, and footwear shall be worn at operations where chloroform may contact the skin.</li> <li>3. Eye protective devices shall be provided by the employer and used by the employees where contact of chloroform with eyes is likely.</li> <li>4. The employer shall ensure that all personal protective devices are inspected regularly and maintained in clear and satisfactory working condition.</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of all sampling and analysis of chloroform shall be maintained for at least 30 yrs after the individual's employment is terminated.</li> <li>2. Records shall indicate the details of the type of personal protective devices, if any, in use at the time of sampling, and the methods of sampling and analysis used.</li> <li>3. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>4. If the employer who has or has had employees with occupational exposure to chloroform ceases business without a successor, he shall forward their records by registered mail to the Director, NIOSH.</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to chloroform in any establishment where chloroform is used, stored, or manufactured.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELING</b>	<b>POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
Chloroform (continued)		environmental limit. In such cases, suitable controls shall be instituted and monitoring shall continue at 1-wk intervals until 3 consecutive surveys indicate the adequacy of controls.	5. Work clothing may not be taken home by employees. The employer shall provide for maintenance and laundering of protective clothing.  6. The employer shall ensure that precautions necessary to protect laundry personnel are taken while soiled protective clothing is being laundered.  7. The employer shall ensure that chloroform is not discharged into municipal waste treatment systems or the community air.  <b>Eye protection</b>  8. Unless eye protection is afforded by a respirator hood or facepiece, protective goggles or a face shield shall be worn at operations where there is danger of contact of the eyes with wet materials containing chloroform because of spills, splashes, or excessive vapors in the air.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chloroform (continued)			<b>Respiratory Protection</b> 9. The employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided anytime the concentration of chloroform exceeds the PEL. 10. Where an emergency may develop which could result in employee injury from chloroform, the employer shall provide an escape device as listed in Table I-1. <b>Hygiene practices</b> 11. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>bis-Chloromethyl ether</b> <b>(1910.1008, 11/78)</b>	1. Physical exam, with attn to: a. Decreased immuno- competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking.  2. Personal, family, and occupational histories, with emphasis on: a. Genetic factors; b. Environmental factors.	<b>At least annually</b> 1. Same as in A.	1. Retain for the duration of employment for all authorized employees and all employees considered for assignment to enter regulated areas.  2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.  3. Provide upon request to employees, the Sec. of OSHA, and the Director of NIOSH.  4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.	

OBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>bis-Chloromethyl ether</b> (1910.1008)		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where bis-chloromethyl ether is manufactured, processed, used, packaged, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where bis-chloromethyl ether is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in bis-chloromethyl ether handling operations involving transfer from a</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of bis-chloromethyl ether in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which bis-chloromethyl ether is present in each regulated area.</li> <li>3. Incidents resulting in release of bis-chloromethyl ether into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>bis-Chloromethyl ether</b> (continued)</p>			<p>closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a full-face, supplied air respirator of the continuous flow or pressure demand type in accordance with 1910.134.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>explanation of the procedure used in determining this figure; a description of the area involved, and the extent of known employee exposure; any medical treatment given, or surveillance implemented; an analysis of the circumstances of the incident, and measures taken to avoid further releases.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Chloroprene</b> <b>(NIOSH 77-210, 8/77)</b>	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Eyes;</li> <li>Central nervous system;</li> <li>Hepatic system;</li> <li>Pulmonary system;</li> <li>Renal system.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Eyes;</li> <li>CNS function.</li> </ol> </li> <li>Clinical tests, at least:               <ol style="list-style-type: none"> <li>Urinalysis;</li> <li>14" x 17" post/ant chest X-ray;</li> <li>Pulmonary function test (FVC, FEV1.0);</li> <li>Determination of SGPT;</li> <li>ECG;</li> <li>Others, as DBRP.</li> </ol> </li> <li>Ability to use positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees exposed.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>In an emergency</b> <ol style="list-style-type: none"> <li>First aid, especially with regard to:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Lungs.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chloroprene (NIOSH 77-210, 8/77)	<ol style="list-style-type: none"><li>1. Ceiling limit for 15 min: 3.6 (1).</li><li>2. Samples of workplace air shall be collected and analyzed at least annually as described in Appendices I and II, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.</li></ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"><li>1. The employer shall conduct an IH survey at each location where chloroprene is released into the workplace air to determine whether exposure to airborne chloroprene is in excess of the occupational exposure limit.</li><li>2. Surveys shall be repeated at least quarterly and within 30 days of any process change likely to result in an increase in airborne chloroprene concentrations.</li></ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"><li>3. If the employer has determined that the environmental concentration of chloroprene in a workplace may exceed the occupational exposure limit, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed to chloroprene.</li></ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"><li>1. The employer shall provide appropriate protective clothing for use in any operation where the worker has any possibility of coming into direct contact with liquid chloroprene. The clothing shall be both impervious and resistant to chloroprene.</li><li>2. Gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary.</li><li>3. Impervious supplied-air hoods or suits shall be worn when entering confined spaces, such as pits or tanks, unless they are known to be safe.</li><li>4. In situations where heat stress is likely to occur, air-supplied suits shall be used.</li><li>5. All protective clothing shall be cleaned, well-aired, and inspected for defects prior to reuse.</li></ol>	<ol style="list-style-type: none"><li>1. IH survey records shall be kept.</li><li>2. Employers or their successors shall keep records of environmental monitoring for each employee for at least 30 yrs after the individual's employment has terminated.</li><li>3. These records shall include the name of the employee being monitored; dates of measurements; duties and job locations within the worksite; sampling and analytical methods used and evidence of their accuracy; number and duration of samples, results of analyses, and occupational exposure concentrations based on these samples; and personal protective equipment used by the employee.</li><li>4. Records for each employee which indicate date of employment with the company and changes in job assignment shall be kept for the same 30-yr duration.</li></ol>	Yes	Yes	Yes	<ol style="list-style-type: none"><li>1. Occupational exposure = work in any establishment where chloroprene is manufactured, stored, handled, used, or otherwise present.</li></ol>	

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chloroprene (continued)		<p>4. Source and area monitoring may be used to supplement personal monitoring.</p> <p>5. Routine monitoring of employee exposures shall be conducted at least quarterly.</p> <p>6. The exposure of affected employees shall be monitored at least once every 3 mos. In the event of overexposure, control measures shall be initiated and the employee shall be notified of the overexposure and of the control measures being instituted. Such monitoring shall continue until 2 determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental limit; routine monitoring may then be resumed.</p>	<p><b>Eye protection</b></p> <p>6. The employer shall provide face shields (8 in minimum) with goggles and shall ensure that employees wear the protective equipment at any operation which affords a possibility of liquid chloroprene coming into contact with the eyes.</p> <p><b>Respiratory protection</b></p> <p>7. The employer shall provide respirators in accordance with Table I-1 and shall ensure that employees use the respirators provided.</p> <p>8. When a self-contained breathing apparatus is selected, the employer shall provide initial training and monthly refresher courses on the use, maintenance, and function of the self-contained breathing apparatus.</p> <p>9. Respirators shall be easily accessible, and employees shall be informed of their location.</p>	<p>5. The employer shall make these records available on request to authorized representatives of the Assistant Sec. of Labor for OSHA or of the Director of NIOSH.</p> <p>6. Employees and former employees, or their authorized representatives, shall have access to information on their own exposures.</p> <p>7. The employee or the employee's representative shall be given the opportunity to observe any measurement conducted.</p> <p>8. Any observer shall have the right to an explanation of the procedures used, of the results of the measurements, and of the meaning of the results for human health and safety.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Chloroprene (continued)</b>			10. Emergency exits shall be located at clearly identified stations within the work area and shall be adequate to permit all employees to escape safely from the area.  11. The employer shall provide eyewash fountains at locations convenient to, but not within, areas of possible exposure to chloroprene.  <b>Hygiene practices</b> 12. Sanitation measures specified.						



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Chromic acid (NIOSH 73-11021, 1973)</p>	<ol style="list-style-type: none"> <li>1. Work history: All exposures to chromic acid and other hexavalent chromium compounds.</li> <li>2. Medical history, including: <ol style="list-style-type: none"> <li>a. Skin sensitivity;</li> <li>b. Pulmonary sensitivity;</li> <li>c. Skin or mucous membrane condition, such as dermatitis, ulcers;</li> <li>d. Membrane of the upper respiratory tract for bleeding, irritation, ulceration, perforations.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> <li>4. 14" x 17" chest X-ray.</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> <li>2. 14" x 17" chest X-ray, &gt;40 yrs old.</li> </ol> <p><b>Every 5 yrs</b></p> <ol style="list-style-type: none"> <li>3. For those ≤40 yrs old.</li> <li>4. 14" x 17" chest X-ray.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after termination of employment for all employees with 1 or more yrs exposure.</li> <li>2. Retain X-rays for the 5 yrs preceding termination of employment.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, and of the employer.</li> <li>4. Physicians designated and authorized by any employee or former employee shall have access to his medical records.</li> </ol>	<ol style="list-style-type: none"> <li>1. For those with signs/symptoms of skin or upper respiratory tract irritation: <ol style="list-style-type: none"> <li>a. Immediate medical examination.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chromic acid (NIOSH 73-11021, 1973)	<ol style="list-style-type: none"> <li>1. TWA: 0.05 as chromium trioxide.</li> <li>2. Ceiling limit for 15 min: 0.1 as chromium trioxide.</li> <li>3. Procedures for sampling and analysis of air samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Workroom areas shall not be considered to have chromic acid exposure if environmental levels, as determined on the basis of an IH survey or by the judgment of a compliance officer, do not exceed 1/2 of the environmental standard.</li> <li>2. Records of these surveys, including the basis for concluding that air levels are below 1/2 of the environmental standard, shall be maintained.</li> <li>3. When there is chromic acid exposure, environmental monitoring shall be instituted.</li> <li>4. Environmental samples shall be taken within 30 days after installation of a new process or process change.</li> <li>5. Samples shall be collected at least quarterly in accordance with Appendix 1 for the evaluation of the work environment with respect to the recommended standard.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Coveralls or other full-body protective clothing shall be worn in areas where there is occupational exposure to chromic acid. Protective clothing shall be changed at the end of each workday.</li> <li>2. Protective gloves, aprons, and footwear which are impervious to chromic acid shall be worn at operations where chromic acid spills and splashes may contact the skin.</li> </ol> <p><b>Eye protection</b></p> <ol style="list-style-type: none"> <li>3. Unless eye protection is afforded by a respirator hood or facepiece, protective goggles or face shields impervious to chromic acid shall be worn at operations where chromic acid splashes may contact the eyes.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. Appropriate respirators shall be provided and used when a variance has been granted to allow respirators as a means of control of exposure in routine</li> </ol>	<ol style="list-style-type: none"> <li>1. Records of all sampling shall be maintained for at least 20 yrs.</li> <li>2. Records shall indicate the type of personal protective devices, if any, in use at the time of the sampling.</li> <li>3. Records shall be maintained so that they can be classified by employees.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure above 1/2 the PEL.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chromic acid (continued)		6. For work areas in which either the TWA or the ceiling concentration of chromic acid exceeds the standard, monitoring and recordkeeping shall be repeated on a weekly basis until 3 consecutive sampling periods have demonstrated that environmental levels meet the standard.	<p>operations and while the application for variance is pending. Administrative controls may also be used to reduce exposure. Respirators shall also be provided and used for nonroutine operations (occasional brief concentrations above the TWA or ceiling and for emergencies.</p> <p>5. The employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>6. Respiratory protective devices described in Table I-1 shall be those approved either under the following regulations or under 30 CFR 11, published in the <i>Federal Register</i> March 25, 1972.</p> <p>a. Filter-type dust, fume, and mist respirator—30 CFR 14 (Bureau of Mines Schedule 21B);</p> <p>b. Supplied-air respirator—30 CFR 12 (Bureau of Mines Schedule 19B).</p> <p><b>Hygiene practices</b></p> <p>7. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Chromium (VI) (NIOSH 76-129, 12/75)</p>	<ol style="list-style-type: none"> <li>Includes maintenance personnel.</li> <li>Comprehensive medical and work histories, including: <ol style="list-style-type: none"> <li>Potential skin or pulmonary sensitivity;</li> <li>Skin or membranous condition;</li> <li>Smoking habits;</li> <li>History of kidney or liver disease.</li> </ol> </li> <li>Skin exam for evidence of: <ol style="list-style-type: none"> <li>Dermatitis;</li> <li>Chrome ulcers.</li> </ol> </li> <li>Exam of upper respiratory tract membranes for irritation, bleeding, ulceration, perforation.</li> <li>Ability to use negative or positive pressure respirator.</li> <li>Urinalysis.</li> <li>14" x 17" chest X-ray.</li> <li>If considered necessary by responsible physician: <ol style="list-style-type: none"> <li>Sputum cytology;</li> <li>Liver function studies.</li> </ol> </li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for both carcinogenic and non-carcinogenic Cr(VI) for all employees with occupational exposure, including maintenance personnel with periodic exposure, for 30 yrs after termination of employment.</li> <li>Preplacement X-rays and X-rays for the 5 yrs preceding termination of employment shall also be retained 30 yrs.</li> <li>DMR of the Sec. of HHR, of the Sec. of Labor, and of the employer shall have access to all medical records.</li> <li>Physicians designated and authorized by any employee or former employee shall have access to that worker's medical records.</li> </ol>	<ol style="list-style-type: none"> <li>For those developing signs/symptoms of upper respiratory tract irritation due to exposure: <ol style="list-style-type: none"> <li>Medical examination.</li> </ol> </li> </ol> <p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>Remain under physician's care until recovery.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Chromium (VI) (NIOSH 76-129, 12/75)	<div>1. Carcinogenic Cr(VI) TWA: 1 µg/m<sup>3</sup>.</div> <div>2. Noncarcinogenic Cr(VI) TWA: 25 µg/m<sup>3</sup>.</div> <div>3. Ceiling limit for 15 min for noncarcinogenic Cr(VI): 50 µg/m<sup>3</sup>.</div> <div>4. Procedures for sampling and analysis of chromium (VI) in air shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</div>	<div>1. Workers are not considered to have occupational exposure to chromium(VI) if, on the basis of a PIH survey, the airborne concentration of carcinogenic chromium (VI) is sufficiently low that a sampling volume greater than 1.0 cu m is necessary in order to collect 0.5 µg of carcinogenic chromium(VI); and the airborne concentration of noncarcinogenic chromium(VI) is not greater than 1/2 the recommended limit of 25 µg Cr(VI)/cu m.</div> <div>2. All samples of airborne chromium(VI) shall be analyzed by the chemical and analytical method in Appendix II; if samples can be demonstrated to contain only noncarcinogenic chromium (VI), other methods of chemical analysis equivalent to the method in Appendix II may be used.</div> <div>3. In workplaces where chromium(VI) is handled or processed, surveys shall be repeated annually,</div>	<div>Protective clothing</div> <div>1. Coveralls or other full-body protective clothing shall be worn in areas where there is occupational exposure to chromium(VI). Protective clothing shall be changed at least daily at the end of the shift and more frequently if it should become grossly contaminated.</div> <div>2. Impervious gloves, aprons, and footwear shall be worn at operations where solutions of chromium(VI) may contact the skin. Protective gloves shall be worn at operations where dry compounds of chromium(VI) are handled and may contact the skin.</div> <div>3. Work clothing shall not be taken home by employees. The employer shall provide for maintenance and laundering of protective clothing.</div> <div>4. The employer shall ensure that precautions necessary to protect laundry personnel are taken when soiled protective clothing is laundered.</div>	<div>1. Records of IH surveys shall be maintained until a new survey is conducted.</div> <div>2. Records of all sampling and analysis of airborne chromium(VI) shall be maintained at least for 30 yrs after the individual's employment is terminated.</div> <div>3. Records shall indicate the details of the type of personal protective devices, if any, in use at the time of sampling and methods of sampling and analysis used.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposure.</div> <div>5. Daily rosters made of authorized persons entering the regulated areas shall be maintained for 30 yrs.</div> <div>6. In the event that the employer who has employees with occupational exposure to carcinogenic chromium (VI) ceases business without a successor, records shall be forwarded by registered mail to Director, NIOSH.</div>	Yes	Yes	Yes	<div>1. Noncarcinogenic Cr(VI) = the Cr(VI) in monochromates and bichromates of H, lithium, sodium, potassium, rubidium, cesium, and ammonium and Cr(VI) oxide. Carcinogenic Cr(VI) = any and all Cr(VI) materials not found above.</div> <div>2. Occupational exposure for both = exposure to airborne Cr(VI) at concentrations greater than 1/2 the PEL.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Chromium (VI) (continued)</p>		<p>and when any process change indicates a need for reevaluation. Requirements set forth below apply to areas in which there is occupational exposure to chromium(VI).</p> <p>4. In all monitoring, samples representative of the exposure in the breathing zone of employees shall be collected by personal samplers.</p> <p>5. An adequate number of samples shall be taken in order to permit construction of TWA exposures for every operation or process. Except as otherwise determined by a PIH, the minimum number of representative TWA determinations for an operation or process shall be based on the number of workers exposed as provided in the following table:</p>	<p><b>Eye protection</b></p> <p>5. Eye protection shall be provided by the employer and used by the employees where eye contact with chromium(VI) is likely.</p> <p>6. Unless eye protection is afforded by a respirator hood or facepiece, protective goggles or a face shield shall be worn at operations where there is <i>danger of contact of the eye with dry or wet compounds of chromium(VI) because of spills, splashes, or excessive dust or mists in the air.</i></p> <p><b>Respiratory protection</b></p> <p>7. When permissible, the employer shall provide respirators in accordance with Table I-1 or Table I-2 when appropriate, and shall ensure that the employee uses the respirator provided.</p> <p>8. When an emergency may develop which could result in employee injury from chromium(VI), the employer shall provide an escape device as listed in Table I-1, or in Table I-2 where appropriate.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Chromium (VI) (continued)		<p>Number of Employees Exposed</p> <p>Number of TWA Determinations</p> <p>1-20 50% of the number of workers</p> <p>21-100 10 plus 25% of the excess over 20 workers</p> <p>&gt; 100 30 plus 5% of the excess over 100 workers</p> <p>6. A reevaluation of the exposure of workers to airborne chromium(VI) shall be made within 30 days after installation of a new process or process changes.</p> <p>7. Samples of airborne chromium(VI) shall be collected and analyzed at least every 2 mos for those work areas with occupational exposure to carcinogenic chromium(VI) and at least every 3 mos if the airborne chromium (VI) is noncarcinogenic.</p> <p>8. A reevaluation of the workers' exposures to airborne chromium(VI) shall be repeated at 1-wk intervals when the airborne concentration has been found to exceed</p>	<p>Hygiene practices</p> <p>9. Sanitation measures specified.</p>						

## MEDICAL SURVEILLANCE

<p style="text-align: center;"><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p style="text-align: center;"><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p style="text-align: center;"><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p style="text-align: center;"><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Chromium (VI) (continued)		<p>the recommended work- place environmental limit. In such cases, suitable controls shall be instituted and monitoring shall continue at 1-wk intervals until 3 con- secutive surveys indicate the adequacy of controls.</p> <p>9. A regulated area shall be established and main- tained where carcinogenic chromium(VI) is manu- factured, reacted, repackaged, stored, handled, or used; and where airborne concentrations of carcinogenic chromium (VI) are in excess of the PEL.</p> <p>10. Access to the regulated areas shall be limited to authorized personnel.</p>							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE</b> <b>(REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA</b> <b>STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Chrysene (NIOSH 78-163, 5/78) [Special Health Hazards Review]	<ol style="list-style-type: none"> <li>History (not specified), with special emphasis on:               <ol style="list-style-type: none"> <li>Smoking habits;</li> <li>Respiratory tract;</li> <li>Urinary system.</li> </ol> </li> <li>Physical exam, with special emphasis on:               <ol style="list-style-type: none"> <li>Smoking habits;</li> <li>Respiratory tract;</li> <li>Urinary tract.</li> </ol> </li> <li>Clinical tests, including:               <ol style="list-style-type: none"> <li>Chest X-ray;</li> <li>Urinalysis, with other tests (e.g., sputum cytology), as DBRP.</li> </ol> </li> </ol>	At least annually 1. Same as in A.2 and 3.	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after the worker's employment has ended.</li> <li>Include all data obtained from medical examinations which is pertinent to chrysene exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Coal gasification (NIOSH 78-191, 9/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with special emphasis on pre-existing disorders of:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Respiratory tract;</li> <li>Liver;</li> <li>Kidneys.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Oral cavity;</li> <li>Skin;</li> <li>Respiratory system;</li> <li>14" x 17" post/ant X-ray.</li> </ol> </li> <li>Pulmonary function tests, including:               <ol style="list-style-type: none"> <li>FVC, FEV1.0;</li> <li>Sputum cytology;</li> <li>Urinalysis;</li> <li>Urine cytology;</li> <li>ECG;</li> <li>Multiple serum chemistry, as DBRP;</li> <li>Audiometric exam, for those exposed to noise.</li> </ol> </li> <li>Ability to use positive pressure respirator.</li> </ol>	Annually 1. Same as in A.1 and 3.  Biennially 2. Same as in A.2.	<ol style="list-style-type: none"> <li>Retain 30 yrs after last occupational exposure.</li> <li>Include environmental exposure records.</li> <li>Shall be available to the DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee or former employee.</li> </ol>	On termination 1. Same as in B.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Coal gasification (NIOSH 78-191, 9/78)	1. Existing Federal occupational exposure limits shall be enforced except where NIOSH has recommended a reduction in the existing Federal limit, or where there is no existing Federal limit. In such cases, applicable NIOSH recommendations shall be complied with.	1. Area and personal monitoring for respirable particulates shall be conducted at least monthly in the following unit process areas: coal storage and preparation, coal feeding, and ash removal and ash disposal.  2. The frequency of monitoring may be reduced to quarterly if 6 consecutive monthly determinations show that the concentrations of respirable particulates do not exceed the workplace exposure limit.	<b>Protective clothing</b> 1. Employers shall provide, and instruct employees to wear, suitable clothing to prevent skin contact with tar and tar oil where the potential for exposure exists. These garments shall be made of materials resistant to penetration by tar and tar oil.  2. Gloves shall be used that are impervious to process residues. Nondisposable gloves shall be capable of withstanding cleaning.  3. Protective clothing for maintenance employees shall be selected for effectiveness in providing protection from the hazards associated with the specific work area involved.  <b>Eye protection</b> 4. Cup-type chemical safety goggles shall be worn by employees engaged in activities in which hazardous materials may come in contact with the eyes.  5. Full-length plastic face shields (8 in minimum) shall be worn in areas	1. Records of all monitoring shall be retained for the duration of employment and for at least 30 yrs after the employee's last occupational exposure in a coal gasification plant.  2. Includes the dates and times of measurements, job function and location within the workplace, methods of sampling and analysis used, types of respiratory protective devices in use at the time of sampling, concentrations of indicator or other hazardous substances found, and identification of exposed employees.  3. Each employee shall be able to obtain information on his or her own environmental exposures.  4. Workplace monitoring records and entry rosters shall be made available to the government.  5. Signed work permits shall be kept on file for 1 yr after the date of use.	Yes	Yes	Yes		



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Coal gasification (continued)</p>			<p>where contact with tar or tar oil is likely, except when full-facepiece respirators are being worn.</p> <p><b>Respiratory protection</b></p> <p>6. Respirators may be used only during the time necessary to install or test the required controls and for nonroutine operations or during emergencies when brief exposures at concentrations exceeding the limits may occur.</p> <p>7. Respirators shall be provided based on the toxicants to be protected against.</p> <p>8. Emergency respirators for a given area shall be NIOSH- or MSHA-approved for specific protection against the process gases that may be present in that area. Emergency equipment shall be located at well-marked and clearly identified stations and shall be adequate to protect personnel during escape from the area or other emergency operations.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Coal tar products (NIOSH 78-107, 9/77)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on pre-existing disorders of:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Respiratory tract;</li> <li>c. Liver;</li> <li>d. Kidneys.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Oral cavity;</li> <li>b. Skin;</li> <li>c. Respiratory system, including:                   <ol style="list-style-type: none"> <li>i. 35 cm x 42 cm post/ant and lateral chest X-ray;</li> </ol> </li> <li>d. Pulmonary function tests (FVC, FEV1.0);</li> <li>e. Sputum cytology;</li> <li>f. Mucous membrane of the oral cavity;</li> <li>g. Liver function tests, as DBRP;</li> <li>h. Urinalysis, as DBRP.</li> </ol> </li> <li>3. Ability to use positive pressure respirator.</li> </ol>	At least annually 1. Same as in A.1 and 2.	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> <li>3. Include environmental exposure records.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S W O R K	ADDITIONAL INFORMATION
Coal tar products (NIOSH 78-107, 9/77)	1. TWA: 0.1. 2. Methods for sampling and analysis of coal tar products shall be as provided in Appendices I and II.	1. Each employer who has a place of employment in which there is occupational exposure to coal tar products shall institute a program of personal monitoring to measure the exposure of all employees. 2. In all personal monitoring, samples representative of the breathing zone of the employee shall be collected. 3. Each operation in each work area shall be sampled at least once every 3 mos. 4. If an employee is found to be exposed to airborne coal tar products at concentrations in excess of the limit specified, the exposure of that employee shall be measured at least once a wk, control measures shall be initiated, and the employee shall be notified of the extent of the exposure and of the control measures being implemented to reduce the concentration of airborne coal tar products to or below the PEL. Such monitoring shall continue	<b>Protective clothing</b> 1. Employers shall provide, and shall require employees working with creosote to wear, gloves, protective sleeves, aprons, jackets, trousers, caps, and shoes as necessary to prevent skin contact. These garments shall be made of a material resistant to penetration by creosote, such as polychloroprene, polyethylene, rubber, or other suitable material. 2. Employers shall provide, and shall require employees working with creosote to wear, suitable clothing to prevent skin contact with coal tar. These garments shall be made of a material resistant to penetration by coal tar. For employees working with heated coal tar pitch, employers shall require use of protective clothing sufficient to prevent skin contact. 3. Employees handling drums, cans, or other large containers of coal	1. Records of personal monitoring shall be kept for the duration of employment and for at least 30 yrs after the employee's last occupational exposure to coal tar products. 2. These records shall include the dates and times of measurements, job function and location of employees within the worksite, methods of sampling and analysis used, types of respiratory protective devices in use at the time of sampling, concentrations of airborne coal tar products found, and identification of exposed employees. 3. Each employee shall be able to obtain information on his or her own environmental exposures. 4. Daily rosters of authorized persons who enter regulated areas shall be retained for at least 30 yrs. 5. Environmental monitoring records and entry rosters shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = any contact with coal tar, coal tar pitch, or creosote in the work environment.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Coal tar products (continued)</b>		until 2 consecutive determinations, at least 1 wk apart, indicate that the employee is no longer exposed to airborne coal tar products at concentrations greater than the limit specified. Routine monitoring may then be resumed.	tar products shall wear impervious shoes or boots with safety toecaps. Leather safety shoes shall be protected from splashes or spills by impervious coverings such as rubbers.  4. The employer shall ensure that, at the completion of the work shift, all protective clothing is removed only in the change rooms.  5. The employer shall ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of is placed in a closed container in the change room.  <b>Eye protection</b>  6. Cup-type or rubber-framed chemical safety goggles shall be worn by employees engaged in activities in which coal tar products may come in contact with the eyes. When employees are exposed to airborne coal tar products at concentrations in excess of the PEL, a respiratory						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Coal tar products (continued)</p>			<p>protective device with a full facepiece is required.</p> <p>7. Full-length, plastic face shields (20 cm minimum) shall be worn, in addition to safety goggles, by employees working where contact with coal tar products is likely, except where full facepiece respirators are being worn.</p> <p><b>Respiratory protection</b></p> <p>8. The employer shall provide respirators in accordance with Table 1-1 and shall ensure that employees use the respirators properly when the concentration of airborne coal tar products exceeds the PEL.</p> <p>9. Protective equipment suitable for emergency entry shall be located at clearly identified areas outside the work area.</p> <p>10. Emergency equipment shall be located at well- marked and clearly</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>WORK PRACTICES</p>	<p>ADDITIONAL INFORMATION</p>
<p>Coal tar products (continued)</p>			<p>identified stations and shall be adequate to permit all personnel to escape from the area or to cope safely with the emergency on reentry.</p> <p>Hygiene practices</p> <p>11. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Coke oven emissions (1910.1029, 5/78)</b>	<ol style="list-style-type: none"> <li>For those who will work in regulated areas at least 30 days/yr.</li> <li>Work and medical histories, including:               <ol style="list-style-type: none"> <li>Smoking history;</li> <li>Presence and degree of respiratory symptoms (breathlessness, cough, sputum production, wheezing).</li> </ol> </li> <li>Physical exam:               <ol style="list-style-type: none"> <li>14" x 17" post/ant chest X-ray and ILO U/C rating;</li> <li>Pulmonary function tests (FVC, FEV1.0, with recording of type of equipment used);</li> <li>Weight;</li> <li>Skin exam.</li> </ol> </li> <li>Lab tests:               <ol style="list-style-type: none"> <li>Urinalysis (for sugar, albumin, hematuria);</li> <li>Sputum cytology;</li> <li>Urine cytology.</li> </ol> </li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>For those in regulated areas 30 days/yr.</li> <li>Same as in A.</li> </ol> <p><b>Semi-annually</b></p> <ol style="list-style-type: none"> <li>For those 45 yrs old or over, or with 5 or more yrs of employment in the area.</li> <li>Same as in A, even when these employees are transferred to another area.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer, for all employees who are employed in a regulated area at least 30 days per yr.</li> <li>Include name, SSN, description of employee duties, a copy of physician's written opinion, the signed statement of any refusal to take a medical exam, any medical complaints related to coke oven emissions, medical examination results, work history and medical history, lab procedures used and a copy of the standards or guidelines used to interpret test results, the initial X-ray, X-rays for the most recent 5 yrs, any X-ray with a demonstrated abnormality and all subsequent X-rays, the initial cytologic exam slide and written description, the cytologic examination slide and written description for the most recent 10 yrs, any</li> </ol>	<p><b>At least 6 mos preceding termination of employment</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Coke oven emissions (1910.1029)	1. TWA: 150 µg/m <sup>3</sup> .	<ol style="list-style-type: none"><li>Each employer who has a place of employment where coke oven emissions are present shall monitor employees employed in the regulated area to measure their exposure to coke oven emissions.</li><li>The employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an 8-hr period.</li><li>The employer shall collect full-shift (for at least 7 continuous hrs) personal samples, including at least 1 sample during each shift for each battery and each job classification within the regulated areas including at least the job classifications of lidman, tar chaser, larry car operator, luterman, machine operator (coke side), benchman (coke side), benchman (pusher side), heater, quenching car operator, pushing machine operator, screening station</li></ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"><li>The employer shall provide and assure the use of appropriate protective clothing and equipment.</li><li>These shall include flame resistant jacket and pants, flame resistant gloves, face shields or vented goggles which comply with 1910.133 (a), (2), insulation from hot surfaces for footwear, safety shoes which comply with 1910.136, and protective helmets which comply with 1910.135.</li><li>The employer shall clean, launder, or dispose of protective clothing.</li><li>The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.</li><li>The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms.</li></ol>	<ol style="list-style-type: none"><li>The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to coke oven emissions.</li><li>This record shall include the name, SSN, and job classification of the employees monitored; the dates, number, duration, and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable; the type of respiratory protective devices worn, if any; a description of the sampling and analytical methods used and evidence of their accuracy; and the environmental variables that could affect the measurement of employee exposure.</li><li>The employer shall maintain this record for at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer.</li></ol>	Yes	Yes	Yes		

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>Coke oven emissions (continued)</b></p>			<p>atypical cytologic examination slides if such atypia persists for 3 yrs, and all subsequent slides and descriptions.</p> <p>3. Shall be available to Sec. and Director.</p> <p>4. Provide upon request to employee and DMR.</p> <p>5. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director.</p> <p>6. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.</p>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Coke oven emissions (continued)</b></p>		<p>operator, wharfman, oven patcher, oven repairman, spellman, and maintenance personnel.</p> <p>4. The employer shall repeat the monitoring measurements at least every 3 mos.</p> <p>5. Whenever there has been a production, process, or control change which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements for those employees affected by such change or increase.</p> <p>6. The employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure within 5 working days after the receipt of the results or measurements.</p> <p>7. Whenever such results indicate that the representative employee</p>	<p>6. The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of is placed in a closable container in the change room.</p> <p>7. The employer shall inform any person who cleans or launders protective clothing of the potentially harmful effects of exposure to coke oven emissions.</p> <p><b>Respiratory protection</b></p> <p>8. Compliance with the permissible exposure limit may not be achieved by the use of respirators except during the time period necessary to install or implement feasible engineering and work practice controls; in work operations such as maintenance and repair activity in which engineering and work practice controls are technologically not feasible; in work situations where feasible engineering and work practice controls are not</p>	<p>4. The employer shall make available upon request all records required to be maintained to the Sec. and the Director for examination and copying.</p> <p>5. Employee exposure measurement records shall be provided upon request to employees, designated representatives, and the Assistant Sec. in accordance with 29 CFR 1910.</p> <p>6. Whenever the employer ceases to do business, the successor employer shall receive and retain all records.</p> <p>7. Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted by registered mail to the Director.</p> <p>8. At the expiration of the retention period for the records, the employer shall transmit these records by registered mail to the Director or shall continue to retain such records.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Coke oven emissions (continued)</p>		<p>exposure exceeds the permissible exposure limit, the employer shall, in such notification, inform each employee of that fact and of the corrective action being taken to reduce exposure to or below the permissible exposure limit.</p> <p>8. The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less than <math>\pm 35\%</math> for concentrations of coke oven emissions <math>&gt;150 \mu/m^3</math>.</p> <p>9. The employer shall provide affected employees or their DR an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions.</p> <p>10. Whenever observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the use of protective clothing</p>	<p>yet sufficient to reduce exposure to or below the permissible exposure limit; or during emergencies.</p> <p>9. Where respirators are required under this section, the employer shall select, provide, and assure the use of the appropriate respirator or combination of respirators from Table I section (g), (2).</p> <p>10. Whenever respirators are required for concentrations not greater than <math>1500 \mu g/m^3</math>, the employer shall provide, at the option of each affected employee, either a particulate filter respirator or a powered air purifying respirator.</p> <p>11. Respirators shall be selected from among those approved for protection against dust and mist by NIOSH under 30 CFR 11.</p> <p><b>Hygiene practices</b></p> <p>12. Sanitation measures specified.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Coke oven emissions (continued)</b></p>		<p>or equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.</p> <p>11. Without interfering with the measurement, observers shall be entitled to an explanation of the measurement procedures, to observe all steps related to the measurement of coke oven emissions performed at the place of exposure, and to record the results obtained.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Confined spaces (NIOSH 80-106, 12/79)</b>	For Class A and B confined spaces: 1. Ability to use positive and negative pressure respirators. 2. Ability to see and hear warnings, such as flashing lights, buzzers, or sirens. 3. General evaluation of ability to carry out assigned duties and detection of disease or abnormality which may make it difficult to work within confined spaces. 4. A written statement should be given to the employee specifying any condition or abnormality found which would increase risk to the employee's health by working in confined spaces.	For Class A or B confined space workers.	1. Include records of exposure to all known health hazards. 2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Confined spaces (NIOSH 80-106, 12/79)</b>	<ol style="list-style-type: none"> <li>1. Flammability concentration limit: no less than 10% of the lower flammability limit (LFL).</li> <li>2. Oxygen percentage: no less than 19.5% or greater than 25% at 760 mmHg.</li> </ol>	<p><b>Initial testing</b></p> <ol style="list-style-type: none"> <li>1. Entry shall be prohibited until tests for oxygen content, flammability, and toxic materials are completed.</li> <li>2. Any necessary additional tests will be selected and performed to the satisfaction of the qualified person.</li> </ol> <p><b>Class A confined space</b></p> <ol style="list-style-type: none"> <li>3. Continuous monitoring shall be implemented.</li> </ol> <p><b>Classes B and C</b></p> <ol style="list-style-type: none"> <li>4. Monitoring shall be as specified by a PIH.</li> <li>5. Entry into a confined space for any type of hot work shall be prohibited when tests indicate the concentration of flammable gases in the atmosphere is greater than 10% of the LFL.</li> <li>6. Oxygen level must be determined prior to measuring the range of flammability to make necessary corrections in the flammability measurement.</li> </ol>	<ol style="list-style-type: none"> <li>1. The entry permit shall include a list of necessary protective equipment to be used in the confined space as determined by the qualified person.</li> <li>2. The employer shall be responsible for the proper use of safety equipment, and the inspection and maintenance procedures on the equipment.</li> </ol> <p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>3. Full-coverage, impervious clothing shall be worn, as well as impervious gloves.</li> <li>4. Gloves and clothing shall be made of impervious rubber or similar material.</li> <li>5. If the hazards of heat or cold stress exist, clothing tested to protect from such overexposure shall be worn.</li> <li>6. Hard hats shall meet the requirements cited in 29 CFR 1910.135.</li> </ol>	<ol style="list-style-type: none"> <li>1. Calibration of instruments shall be recorded, filed by the employer, and available for inspection 1 yr after the last calibration date.</li> <li>2. The employer shall maintain a written record of training including safety drills, inspections, tests, and maintenance.</li> <li>3. The records shall be retained 1 yr after the last date of training, inspection, test, or maintenance.</li> <li>4. In the event of separation of the employee or disposal of equipment or appliance, records may be disposed of after 1 yr.</li> <li>5. Where atmospheric testing indicates the presence of a toxic substance, records shall be maintained in accordance with the existing Federal regulations.</li> <li>6. These records shall include the dates and times of measurement; duties and location of the employees within the confined space; sampling and analytical methods used; number,</li> </ol>	<p align="center"><b>Yes</b></p>	<p align="center"><b>Yes</b></p>	<p align="center"><b>Yes</b></p>	<ol style="list-style-type: none"> <li>1. Entry shall be by permit only.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Confined spaces (continued)</p>		<p>7. Monitoring of the atmosphere shall be performed in accordance with the permit for entry.</p> <p>8. Equipment for continuous monitoring shall be explosion-proof and equipped with an audible alarm or danger signaling device that will alert employees when a hazardous condition develops.</p> <p>9. Instruments used for testing the atmosphere shall be selected for their functional ability to measure hazardous concentrations.</p> <p>10. Instruments shall be calibrated in accordance with the manufacturer's guidelines or manuals.</p> <p><b>Classes II and III hazardous locations</b></p> <p>11. A fire watch shall be established as part of the entry procedure using Article 500, Sections 5 and 6 of the 1978 National Electrical Code.</p>	<p>7. Foot protection shall meet or exceed the requirements cited in 29 CFR 1910.136 and shall provide, in addition to protection from falling objects, protection from any other hazard identified by the qualified person.</p> <p>8. Other body protection required in specific operations such as welding (flame-proofed), riveting (heat-resistant), and abrasive blasting (abrasive-resistant) shall be provided to ensure worker safety.</p> <p><b>Eye protection</b></p> <p>9. Prescription ground safety glasses or plano goggles shall be worn by persons requiring corrective lenses.</p> <p>10. If irritating vapors or dusts are present, safety goggles shall be worn. Full coverage face shields and goggles shall be worn if specified by a PIH.</p>	<p>duration, and results of the samples taken; PEL concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names.</p> <p>7. These records shall be available to DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</p>				

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Confined spaces (continued)		<p>12. In such areas, surface dust shall be removed and no hot work shall be initiated until the airborne particulate level is below 10% of the LFL for the material.</p> <p>13. When combustible dusts or ignitable fibers/flyings are present, all equipment and ventilation systems used shall comply with Articles 502/503 of the National Electrical Code.</p> <p>14. If tests indicate the oxygen level to be greater than 25%, hot work is prohibited until ventilation techniques have reduced the oxygen level to ~21%. If the percentage of oxygen falls below 19.5%, approved respiratory equipment shall be used.</p>	<p><b>Respiratory protection</b></p> <p>11. Shall be determined by a PIH based on conditions and test results and the work activity performed.</p> <p>12. Half-mask respirators are not recommended in atmospheres greater than 10 times the PEL.</p> <p>13. See Appendix II for guidance in respirator selection.</p> <p>14. Respirators used shall be NIOSH/MSHA approved devices.</p> <p><b>Hearing protection</b></p> <p>15. Shall be required when technology is insufficient to control noise levels and when ambient exposures exceed the limits presented in Table G-16 of 29 CFR 1910.95.</p> <p>16. Emergency alarms must be distinguishable when hearing protection is worn.</p> <p><b>Hand protection</b></p> <p>17. If hands are exposed to rough surfaces or sharp edges, the degree of</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Confined spaces (continued)</b>			<p>protection can range from canvas to metal mesh gloves.</p> <p>18. Gloves of impervious rubber or similar material shall be worn to protect against irritating or toxic materials.</p> <p>19. Heat protective gloves are required when employees handle objects with temperatures greater than 60 C.</p> <p>20. Insulated gloves that have been visually inspected before each use shall be worn where a current flow through the body of more than 5 mA may result from contact with energized electrical equipment. Above 5,000 volts, rubber gloves shall be worn in accordance with 29 CFR 1910.137.</p> <p><b>Additional equipment</b></p> <p>21. A safety belt with "D" rings for attaching a lifeline shall be worn at all times.</p>						

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Confined spaces (continued)			<p>22. A safety belt and harness shall be worn when entering to complete gas analysis; in areas where rescue entry is contra-indicated; when failure of ventilation allows buildup of gases within the time necessary to evacuate the area; when the atmosphere is IDLH.</p> <p>23. A wrist-type harness shall be worn when exit is less than 18 in in diameter.</p> <p>24. When no immediate threat to life exists (as determined by a PIH), lifelines must be available but do not need to be used during entry and work procedures.</p> <p>25. Safety nets shall be used when working 10 ft or more above ground or grade level.</p> <p>26. Life jackets shall be worn if exposed to falls into liquid over 4 ft in depth.</p> <p>27. Insulated floor mats shall be used when hot work requires the use of electrical energy.</p> <p>28. A barricade system shall be developed if inadvertent entry poses a problem.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Cotton dust (1910.1043, 1/79)</b>	<ol style="list-style-type: none"> <li>1. Medical history.</li> <li>2. Standardized questionnaire, which asks questions on:               <ol style="list-style-type: none"> <li>a. Work area;</li> <li>b. Cough;</li> <li>c. Phlegm;</li> <li>d. Chest illness;</li> <li>e. Tightness of chest;</li> <li>f. Breathlessness;</li> <li>g. Smoking;</li> <li>h. Work history;</li> <li>i. Allergies.</li> </ol> </li> <li>3. Pulmonary function (FVC, FEV1.0, and % deviation from standard).</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Medical history.</li> <li>2. Abbreviated work questionnaire.</li> <li>3. Pulmonary function test as in A.3.</li> </ol> <p><b>Semi-annually</b></p> <ol style="list-style-type: none"> <li>4. As DBRP according to pulmonary function tests.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 20 yrs for all employees exposed.</li> <li>2. Include name; SSN; description of duties of employee; copy of medical exam results, including medical and work histories, test results, the physician's recommendations; copy of physician's written opinion; any employee medical complaints related to cotton dust exposure; a copy of the OSHA cotton dust standard (1 copy can be kept for all employees if the standard is referenced in the record of each employee); and a copy of information provided to the physician by the employer (a copy of the regulation, description of employee duties as they relate to exposure, exposure level, description of protective equipment used, information from previous exams which is not readily available to the examining physician).</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<p align="center"><b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b></p>	<p align="center"><b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b></p>	<p align="center"><b>MONITORING REQUIREMENTS</b></p>	<p align="center"><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p align="center"><b>RECORDKEEPING REQUIREMENTS</b></p>	<p align="center"><b>TRAINING</b></p>	<p align="center"><b>LABELLING POSTING</b></p>	<p align="center"><b>PRACTICES WORK</b></p>	<p align="center"><b>ADDITIONAL INFORMATION</b></p>
<p><b>Cotton dust (1910.1043)</b></p>	<p>1. TWA as measured by a vertical elutriator or method of equivalent accuracy and precision:</p> <p>a. Yarn manufacturing: 200 µg/m<sup>3</sup>.</p> <p>b. Slashing and weaving: 750 µg/m<sup>3</sup>.</p> <p>c. Other exposures: 500 µg/m<sup>3</sup>.</p>	<p>1. The sampling device to be used shall be either the vertical elutriator cotton dust sampler or a method of equivalent accuracy and precision.</p> <p>2. If an alternative to the vertical elutriator cotton dust sampler is used, the employer shall establish equivalency by demonstrating that the alternative sampling devices:</p> <p>a. Collect respirable particulates in the same range as the vertical elutriator (approximately 15 µ);</p> <p>b. Replicate exposure data in side-by-side field comparison; and</p> <p>c. Are equivalent within an accuracy and precision range of ±25% for 95% of the samples over the range of 0.5 to 2 times the permissible exposure limit.</p> <p>3. Each employer who has a place of employment in which cotton dust is present shall conduct monitoring by obtaining measurements which are representative of the exposure of all employees</p>	<p><b>Respiratory protection</b></p> <p>1. Respirators shall be permitted during the time periods necessary to install or implement feasible engineering controls and work practice controls; during maintenance and repair activities in which engineering controls are not feasible; in work situations where feasible controls are not yet sufficient to reduce exposure to or below the PEL; and where compressed air "blow down" is performed.</p> <p>2. When permissible, respirators shall be selected in accordance with Table I, section (f) (2).</p> <p>3. Respirators shall be NIOSH-approved under 30 CFR 11.</p> <p>4. For concentrations not greater than 5 times the applicable exposure limit, the employer shall provide and permit the employee to use single-use dust respirators in preference to those specified in the table.</p>	<p>1. The employer shall establish and maintain an accurate record of all exposure measurements.</p> <p>2. The record shall include a log containing the items listed in paragraph IV(a) of Appendix A of OSHA Standard; the dates, number, duration, and results of each of the samples taken; a description of the procedure used to determine representative employee exposures; the type of protective devices worn, if any, and length of time worn; and the names, SSN, job classifications, and exposure levels of employees whose exposure the measurement is intended to represent.</p> <p>3. The employer shall maintain this record for at least 20 yrs.</p> <p>4. Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained.</p> <p>5. Whenever the employer ceases to do business, and there is no successor</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Cotton dust (continued)</b>			3. Shall be available to the Assistant Sec. and the Director. 4. Provide upon request to employee and DMR. 5. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director. 6. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Cotton dust (continued)</b>		<p>to airborne concentrations of lint-free respirable cotton dust over an 8-hr period.</p> <p>4. Repeat the measurements at least every 6 mos and whenever there has been a production, process, or control change which may result in new or additional exposure to cotton dust, or whenever the employer has any other reason to suspect an increase in employee exposure.</p> <p>5. Within 5 working days after the receipt of monitoring results, the employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure.</p> <p>6. Whenever the results indicate that the employee's exposure exceeds the applicable PEL, the employer shall include in the written notice a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure below the PEL.</p>	<p>5. For concentrations not greater than 100 times the PEL, the employer shall, upon request, provide a powered air purifying respirator with a high efficiency particulate filter in lieu of those specified in the table.</p> <p>6. Whenever a physician determines that an employee is unable to wear any form of respirator, including a power air purifying respirator, the employee shall be given the opportunity to transfer to another position which is available or which later becomes available having a dust level at or below the PEL. The employer shall assure that an employee who is transferred due to an inability to wear a respirator suffers no loss of earnings or other employment rights or benefits as a result of the transfer.</p> <p>7. The employer shall institute a respirator program.</p>	<p>employer to receive and retain the records, these records shall be transmitted to the Director.</p> <p>6. At the expiration of the retention period for the records required to be maintained, the employer shall notify the Director at least 3 mos prior to the disposal of such records and shall transmit those records to the Director if he requests them within that period.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G P O S T I N G</b>	<b>P R A C T I C E S W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Cotton dust (continued)</b>		<p>7. The employer shall provide affected employees or their DR an opportunity to observe any measuring or monitoring of employee exposure to cotton dust.</p> <p>8. Whenever observation of the measuring or monitoring of employee exposure to cotton dust requires entry into an area where the use of personal protective equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.</p> <p>9. Without interfering with the measurement, observers shall be entitled to:</p> <ul style="list-style-type: none"> <li>a. An explanation of the measurement procedures;</li> <li>b. An opportunity to observe all steps related to the measurement of airborne concentrations of cotton dust performed at the place of exposure; and</li> <li>c. An opportunity to record the results obtained.</li> </ul>	<p>8. The employer shall assure that the respirator used by each employee exhibits minimum facepiece leakage and that the respirator is fitted properly.</p> <p>9. The employer shall allow each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected by the employee. The employer shall maintain an adequate supply of filter elements for this purpose.</p> <p>10. The employer shall allow employees who wear respirators to wash their faces and respirator facepieces to prevent skin irritation associated with respirator use.</p>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Cotton dust in cotton gins (1910.1046, 8/79) [Deleted as OSHA Standard, June 19, 1981]</p>	<ol style="list-style-type: none"> <li>1. Medical history.</li> <li>2. Standardized questionnaire, which asks questions on:               <ol style="list-style-type: none"> <li>a. Work area;</li> <li>b. Cough;</li> <li>c. Phlegm;</li> <li>d. Chest illness;</li> <li>e. Tightness of chest;</li> <li>f. Breathlessness;</li> <li>g. Other illnesses or allergies;</li> <li>h. Smoking.</li> </ol> </li> <li>3. Pulmonary function (FVC, FEV1.0, and % deviation from standard).</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> <li>2. If FEV &lt;60% of predicted value, refer to physician for detailed pulmonary function tests.</li> </ol> <p><b>Mid-season tests: After 14 days of employment and before the end of employment for the season</b></p> <ol style="list-style-type: none"> <li>3. Same as in A.</li> <li>4. The pulmonary function tests shall be repeated during the shift, no sooner than 4 and no more than 10 hrs after beginning of shift; not more than 1 hr after cessation of exposure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 10 yrs for all employees exposed.</li> <li>2. Include name, SSN, and description of the duties of the employee; a copy of the medical surveillance results, including the medical history, questionnaire responses, results of all tests and the physician's recommendations; a copy of the physician's written opinion; any employee medical complaints related to exposure to cotton dust; the type of protective devices worn and length of time worn; and a copy of the OSHA Standard (the employer may keep 1 copy for all employees provided he references the standard in the medical surveillance record of each employee).</li> <li>3. Shall be available upon request to the Assistant Sec. of Labor and the Director of NIOSH, employees, or DMR.</li> <li>4. Whenever the employer ceases to do business, the successor employer shall</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Cotton dust in cotton gins (1910.1046) [Deleted as OSHA Standard, June 19, 1981]</p>	<p>1. Work practices shall minimize cotton dust exposure to the lowest levels feasible.</p>		<p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>1. Respirators shall be used by workers identified by medical surveillance as needing to limit exposure to cotton dust; during operations such as maintenance and repair activities, in which work practice controls are not feasible; and where compressed air "blow down" is performed.</li> <li>2. Shall be made available, upon request, to any employee exposed to cotton dust.</li> <li>3. All respirators shall be NIOSH-approved under the provision of 30 CFR Part 11.</li> <li>4. Where respirators are required, the employer shall provide either any NIOSH-approved respirator or, at the option of each affected worker, a NIOSH-approved powered air purifying respirator with a high efficiency filter.</li> <li>5. The employer shall institute a respirator program in accordance with 1910.134 (b), (d), (e), and (f).</li> </ol>		<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Cotton dust in cotton gins (continued)			receive and retain all records. If there is no successor employer, records shall be transmitted to the Director. 5. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Cotton dust in cotton gins (continued)</p>			<p>6. The employer shall assure that the respirator used by each employee exhibits minimum facepiece leakage and that the respirator is fitted properly.</p> <p>7. Employees shall be allowed to change filter elements whenever an increase in breathing resistance is detected.</p> <p>8. Employees shall be allowed to wash their faces and respirator facepieces to prevent skin irritation associated with respirator use.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Cresol (NIOSH 78-133, 2/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, emphasizing pre-existing disorders of:               <ol style="list-style-type: none"> <li>Lungs;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Pancreas;</li> <li>Nervous system;</li> <li>Cardiovascular system;</li> <li>Skin.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Lungs;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Pancreas;</li> <li>Skin;</li> <li>Nervous system;</li> <li>Cardiovascular system.</li> </ol> </li> <li>Urinalysis, including microscopic exam.</li> <li>Other tests:               <ol style="list-style-type: none"> <li>Blood count;</li> <li>Liver function;</li> <li>Kidney function.</li> </ol> </li> <li>Ability to use positive and negative pressure respirators.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>Same as in A.1, 2, 3, and 4.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>For those complaining of skin abnormalities such as scaling, crusting, or irritation that may be attributed to cresol:               <ol style="list-style-type: none"> <li>Medical exam.</li> </ol> </li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>First aid.</li> <li>Prompt medical care.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Cresol (NIOSH 78-133, 2/78)	1. TWA: 10 (2.3). 2. Procedures for collection and analysis of environmental samples shall be as provided in Appendix I, or by any methods shown to be equivalent in accuracy, precision, and sensitivity to the methods specified.	Industrial hygiene survey 1. Employers shall determine by an IH survey whether exposure to airborne cresol is in excess of the action level. 2. Surveys shall be repeated at least once every yr and within 30 days of any process change likely to result in an increased concentration of airborne cresol.  Personal monitoring 3. When the IH survey demonstrates that the environmental concentration of cresol exceeds the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed to airborne cresol. 4. Source and area monitoring may be used to supplement personal monitoring. 5. Each operation shall be sampled at least once every 3 mos or as otherwise indicated by a PIH.	Protective clothing 1. Depending on the operations involved and the probable extent of exposure, protective clothing and equipment, including gloves, aprons, suits, boots, and face shields (8 in minimum) with goggles, shall be worn to prevent skin contact with particulate cresol.  Eye protection 2. Safety glasses with side shields shall be worn wherever there is occupational exposure to cresol. 3. Chemical safety goggles or face shields (8 in minimum) with goggles shall be provided by the employer and shall be worn during any operation in which particulate cresol may enter the eyes.  Respiratory protection 4. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided when necessary.	1. IH survey records shall be maintained. 2. Records of environmental monitoring shall be kept for at least 30 yrs. 3. These records shall include the dates and times of measurements; duties and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; TWA concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names. 4. These records shall be available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.	Yes	Yes	Yes	1. Occupational exposure = work in any area where cresol is produced, processed, stored, or otherwise used. 2. Action level = 1/2 the TWA.	



## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Cresol (continued)		<p>6. If an employee is found to be exposed at a level in excess of the TWA, the exposure of that employee shall be measured at least once every wk, controls initiated, and the employee notified of the exposure and of the control measures being implemented. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that employee exposure no longer exceeds the PEL. Quarterly monitoring shall then be resumed.</p>	<p>5. The employer shall ensure that respirators are adequately cleaned and maintained and that employees are trained and drilled at least annually in the proper use and testing for leakage of respirators assigned to them.</p> <p>6. Respirators shall be easily accessible, and employees shall be informed of their location.</p> <p><b>Hygiene practices</b></p> <p>7. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Crystalline silica (NIOSH 75-120, 11/74)	1. Medical and work history: a. Exposure to free silica; b. Signs/symptoms of respiratory disease. 2. 14" x 17" or 14" x 14" post/ant chest X-ray. 3. Baseline FVC and FEV1.0. 4. Ability to use negative or positive pressure respirator. 5. Body weight, height, and age.	At least every 3 yrs 1. Same as in A, except 3.	1. Retain at least 30 yrs after termination of employment for all employees subject to exposure. 2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Crystalline silica (NIOSH 75-120, 11/74)	1. TWA: 0.050.  2. Procedures for sampling, calibration of equipment, and analysis of environmental samples shall be as provided in Appendices I and II, or by methods shown to be equivalent in sensitivity, accuracy, and precision to the method specified.	1. Work environments where it has been determined, on the basis of a PIH survey or by the judgment of a compliance officer, that the workers' exposure does not exceed 1/2 of the standard shall not be considered to have exposure to free silica.  2. Surveys shall be repeated when any process change indicates a need for reevaluation or at the discretion of the compliance officer.  3. In areas where there is exposure to free silica, monitoring shall be instituted which is representative of the exposure in the breathing zone of employees.  4. The minimum number of TWA determinations for an operation or process shall be based on the number of workers exposed as provided in the table below, or as otherwise indicated by a PIH survey.  5. The minimum number of TWA determinations shall be based on the number of exposed workers:	<b>Respiratory protection</b>  1. Respirators may be used only when a variance is granted under OSHA for use in routine operations and during the interim period for application of a variance because the PEL cannot be met by limiting the concentration of free silica in the work environment. Also, use for nonroutine operations (occasional brief exposures above the PEL and for emergencies).  2. Respirators shall be selected in accordance with Table I-1, and employers shall ensure that the employee uses the appropriate respirator.  3. Respirators shall be those approved under 30 CFR 11 (March 25, 1972), or under the following regulations: a. Filter-type dust, fume, and mist respirators—30 CFR 14 (Bureau of Mines Schedule 21B); b. Supplied-air respirator—30 CFR 12 (Bureau of Mines Schedule 19B).  4. Employees experiencing difficulty in breathing	1. IH survey records shall be maintained.  2. Records of all sampling schedules shall be maintained for at least 30 yrs following termination of employment.  3. Includes sampling and analytical methods, type of personal protective devices in use at the time of sampling, and the determined free silica dust concentration.  4. Each employee shall be able to obtain information about his or her environmental exposure.	Yes	Yes	Yes	1. Occupational exposure = exposure greater than 1/2 the PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Crystalline silica (continued)		<table><thead><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr></thead><tbody><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>6. Work environment (breathing zone) samples shall be taken within 30 day's after installation of a new process or process change.</p> <p>7. Samples shall be collected and analyzed at least every 6 mos in accordance with Appendices I and II.</p> <p>8. When monitoring of a worker's exposure indicates a free silica concentration in excess of the recommended standard, suitable controls shall be initiated to reduce the exposure level to or below the PEL. Monitoring shall continue at 30-day intervals until 2 consecutive surveys indicate the PEL is no longer exceeded.</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>while using respirators shall be evaluated by a physician to determine their ability to wear a respirator.</p> <p><b>Work clothing</b></p> <p>5. Where exposure to free silica is above the PEL, work clothing shall be vacuumed before removal.</p> <p>6. Clothes shall not be cleaned by blowing or shaking.</p>						
Number of Employees Exposed	Number of TWA Determinations																
1-20	50% of the number of workers																
21-100	10 plus 25% of the excess over 20 workers																
> 100	30 plus 5% of the excess over 100 workers																

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Crystalline silica (continued)</b>		9. Periodic review and evaluation of environmental and medical data shall be performed to determine the effectiveness of control measures.							



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
1,2-Dibromo-3-chloropropane (1910.1044, 7/78)	<ol style="list-style-type: none"> <li>1. Medical and work histories, including reproductive history.</li> <li>2. Physical exam, including: <ol style="list-style-type: none"> <li>a. Genitourinary tract, testicle size, body habitus, including sperm count;</li> <li>b. Serum specimen: FSH, LH, total estrogen (for women), and others, as DBRP.</li> </ol> </li> </ol>	<p>Annually</p> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> <li>2. Additional appropriate examinations, as DBRP.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 40 yrs or the duration of employment plus 20 yrs, whichever is longer, for all employees who work in regulated areas and employees who are subject to exposures in an emergency situation.</li> <li>2. Include the name and SSN of the employee, a copy of the physician's written opinion, any employee medical complaints related to exposure to DBCP, a copy of the information provided the physician by the employer, and a copy of the employee's medical and work history.</li> <li>3. Provide to the employee, DMR, and the Assistant Sec. upon request.</li> <li>4. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director.</li> </ol>	<p>In an emergency</p> <ol style="list-style-type: none"> <li>1. Sperm count as soon as possible, and 3 mos later.</li> <li>2. If vasectomized, serum specimen as in A.2.b.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
1,2-Dibromo-3-chloropropane (1910.1044)	1. TWA: 1 ppb. 2. The employer shall assure that no employee is exposed to eye or skin contact with DBCP.	1. Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to DBCP over an 8-hr period. 2. Monitoring shall be conducted wherever DBCP is present. 3. If exposures are found to be below the PEL, quarterly monitoring shall be conducted. 4. If exposures are in excess of the PEL, monthly monitoring shall be conducted until at least 2 consecutive measurements, taken at least 7 days apart, are below the PEL. 5. Additional monitoring shall be conducted whenever a production, process, control, or personnel change may result in any new or additional exposure to DBCP, or whenever the employer has reason to suspect new or additional exposures.	Protective clothing 1. Where there is any possibility of eye or dermal contact with liquid or solid DBCP, the employer shall provide impermeable protective clothing and equipment to protect the area of the body which may come in contact with DBCP. 2. The employer shall assure that employees remove DBCP-contaminated work clothing only in change rooms. 3. The employer shall assure that employees promptly remove any protective clothing and equipment which becomes contaminated with DBCP-containing liquids and solids. This clothing shall not be reworn until the DBCP has been removed from the clothing or equipment. 4. The employer shall assure that no employee takes DBCP-contaminated protective devices and work clothing out of the change room, except those employees	1. Exposure monitoring records shall be maintained for at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer. 2. Includes the dates, number, duration, and results of each sample taken, including a description of the sampling procedure used to determine representative employee exposure; a description of the sampling and analytical methods used; types of respiratory protective devices worn, if any; and the name, SSN, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent. 3. If the employer ceases to do business, the successor shall receive and retain all records for the prescribed period. 4. If there is no successor employer, the records shall be transmitted by mail to the Director.	Yes	Yes	Yes	1. DBCP = 1,2-dibromo-3-chloropropane.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>1,2-Dibromo-3-chloropropane</b> (continued)			5. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<p align="center"><b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b></p>	<p align="center"><b>ENVIRONMENTAL STANDARD</b>  mg/m<sup>3</sup> (ppm)</p>	<p align="center"><b>MONITORING REQUIREMENTS</b></p>	<p align="center"><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p align="center"><b>RECORDKEEPING REQUIREMENTS</b></p>	<p align="center"><b>T R A I N I N G</b></p>	<p align="center"><b>L A B E L I N G</b></p>	<p align="center"><b>P O S T I N G</b></p>	<p align="center"><b>P R A C T I C E S</b></p>	<p align="center"><b>ADDITIONAL INFORMATION</b></p>
<p><b>1,2-Dibromo-3-chloropropane (continued)</b></p>		<p>6. Employees or their DR shall be given the opportunity to observe any monitoring of employee exposure to DBCP.</p> <p>7. The employer shall provide the observer with personal protective clothing or equipment required to be worn by employees in the area. The observer shall also comply with all other safety and health procedures.</p> <p>8. The observer is entitled to receive an explanation of the measurement procedures, observe all steps related to measurement of airborne concentrations of DBCP performed at the place of exposure, and record the results obtained.</p> <p>9. Within 5 working days after the receipt of monitoring results, the employer shall notify each employee in writing of the measurements which represent the employee's exposure.</p>	<p>authorized to do so for the purpose of laundering, maintenance, or disposal.</p> <p>5. DBCP-contaminated protective devices and work clothing shall be placed in closed containers which prevent dispersion of the DBCP outside the container.</p> <p>6. Containers of DBCP-contaminated protective devices or work clothing which are to be taken out of change rooms or the workplace for cleaning, maintenance, or disposal shall bear proper labels. The employer shall provide clean protective clothing and equipment at least daily to each affected employee.</p> <p>7. The employer shall inform any person who launders or cleans DBCP-contaminated protective clothing or equipment of the potentially harmful effects of exposure to DBCP.</p>	<p>5. At the expiration of the retention period, the employer shall transmit the records by mail to the Director of NIOSH.</p> <p>6. Records shall be available to the Assistant Sec. of Labor for OSHA and the Director of NIOSH.</p> <p>7. Employees or their DR shall have access to their own records.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>1,2-Dibromo- 3-chloropropane</b> (continued)</p>		<p>10. Whenever the results indicate that employee exposure exceeds the PEL, the employer shall include in the written notice a statement that the PEL was exceeded and a description of the corrective action being taken to reduce exposure to or below the PEL.</p>	<p>8. The employer shall prohibit the removal of DBCP from protective clothing and equipment by blowing or shaking.</p> <p><b>Eye protection</b></p> <p>9. Eye and face protection shall meet the requirements of 1910.133.</p> <p><b>Respiratory protection</b></p> <p>10. Respirators shall be used during the period necessary to install or implement feasible engineering and work practice controls; during maintenance and repair activities in which engineering and work practice controls are not feasible; in work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit; or in emergencies.</p> <p>11. Respirators shall be selected in accordance with Table I.</p> <p>12. All respirators shall be those approved by NIOSH under the provisions of 30 CFR 11.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>1,2-Dibromo- 3-chloropropane (continued)</b>			<b>Hygiene practices</b> 13. Personal hygiene measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>3,3-dichlorobenzidine (and its salts)</b> <b>(1910.1007, 11/78)</b>	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	<b>At least annually</b> 1. Same as in A.	1. Retain for the duration of employment for authorized employees and employees considered for assignment to enter regulated areas. 2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director. 3. Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH. 4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.	

OBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>3,3-dichlorobenzidine (and its salts) (1910.1007)</b>		<p>1. A regulated area shall be established where 3,3-dichlorobenzidine is <i>manufactured, processed, used, repackaged, released, handled, or stored.</i></p> <p>2. Access shall be restricted to authorized employees.</p>	<p><b>Protective clothing</b></p> <p>1. In operations involving "laboratory-type hoods," or where 3,3-dichlorobenzidine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</p> <p>2. Prior to each exit from a <i>regulated area, employees</i> shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</p>	<p>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</p> <p>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of 3,3-dichlorobenzidine in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which 3,3-dichlorobenzidine is present in each regulated area.</p> <p>3. Incidents resulting in release of 3,3-dichlorobenzidine into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</p>	Yes	Yes	Yes	<p>1. Open vessel system operations are prohibited.</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
3,3-dichlorobenzidine (and its salts) (continued)			<b>Respiratory protection</b> 3. Employees engaged in 3,3-dichlorobenzidine handling operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.  <b>Hygiene practices</b> 4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.	4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Diisocyanates (NIOSH 78-125, 9/79)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on:               <ol style="list-style-type: none"> <li>a. Pre-existing respiratory conditions;</li> <li>b. Smoking history.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Respiratory tract.</li> </ol> </li> <li>3. Clinical tests, including:               <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. Baseline measurement of FVC and FEV1.0.</li> </ol> </li> <li>4. Ability to use positive and negative pressure respirators.</li> </ol>	Annually, as DBRP <ol style="list-style-type: none"> <li>1. Interim medical and work histories.</li> <li>2. Physical examination with particular attn to respiratory tract, and including FVC and FEV1.0.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after last occupational exposure for all workers.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> <li>3. Include environmental exposure records.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<p align="center"><b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b></p>	<p align="center"><b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b></p>	<p align="center"><b>MONITORING REQUIREMENTS</b></p>	<p align="center"><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p align="center"><b>RECORDKEEPING REQUIREMENTS</b></p>	<p align="center"><b>T R A I N I N G</b></p>	<p align="center"><b>L A B E L I N G  P O S T I N G</b></p>	<p align="center"><b>P R A C T I C E S  W O R K</b></p>	<p align="center"><b>ADDITIONAL INFORMATION</b></p>
<p><b>Diisocyanates (NIOSH 78-125,9/79)</b></p>	<p>1. TWA: toluene diisocyanate (TDI): 35 µg/m<sup>3</sup>; diphenylmethane (MDI): 50 µg/m<sup>3</sup>; hexamethylene (HDI): 35 µg/m<sup>3</sup>; naphthalene (NDI): 40 µg/m<sup>3</sup>; isophorone (IPDI): 45 µg/m<sup>3</sup>; dicyclohexyl methane 4,4'-diisocyanate (hydrogenated MDI): 55 µg/m<sup>3</sup>.</p> <p>2. Ceiling limit for 10 min: TDI: 140 µg/m<sup>3</sup>; MDI: 200 µg/m<sup>3</sup>; HDI: 140 µg/m<sup>3</sup>; NDI: 170 µg/m<sup>3</sup>; IPDI: 180 µg/m<sup>3</sup>; hydrogenated MDI: 210 µg/m<sup>3</sup>.</p>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>Employers shall conduct an IH survey at locations where diisocyanates are present in the workplace air to determine whether there is potential exposure to airborne diisocyanates.</li> <li>Surveys shall be repeated at least annually and as soon as practicable after any change likely to result in increased concentrations of airborne diisocyanates.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>If it has been determined that there is occupational exposure to diisocyanates, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed to diisocyanates.</li> <li>Personal monitoring may be supplemented by source and area monitoring.</li> <li>Samples from each operation in each work area and each shift shall be taken at least once every 6 mos, or as otherwise indicated by a PIH.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>The employer shall provide employees with protective clothing and equipment of materials resistant to penetration by diisocyanates, such as rubber or polyvinyl chloride, when necessary to prevent skin and eye contact with diisocyanates.</li> <li>The employer shall provide appropriate protective clothing and equipment that are resistant to penetration by diisocyanates, including gloves, aprons, suits, and boots, and shall ensure that employees wear these when needed to prevent skin contact with liquid diisocyanates.</li> <li>Workers within 10 ft of spraying operations, or at greater distances when there is a greater drift of spray, shall be protected with impervious clothing, gloves, and footwear in addition to required respiratory protection.</li> <li>Rubber shoes or rubbers over leather shoes shall be worn whenever there</li> </ol>	<ol style="list-style-type: none"> <li>IH survey records shall be maintained.</li> <li>Environmental monitoring records shall be kept for at least 30 yrs after the last occupational exposure to diisocyanates.</li> <li>The records shall include the dates and times of measurement; duties and job locations within the worksite; sampling and analytical methods used; the number, duration, and results of samples taken; concentrations of diisocyanates in air estimated from these samples; the type of personal protection in use at the time of sampling; and identification of the exposed employee.</li> <li>Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>Environmental monitoring records shall be made available to DR of the Sec. of Labor, the Sec. of HHS, and the employee or former employee.</li> </ol>	<p align="center">Yes</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	<ol style="list-style-type: none"> <li>Occupational exposure = exposure to airborne diisocyanates at concentrations above 1/2 the appropriate TWA or ceiling limit.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Diisocyanates (continued)</b>	3. If other diisocyanates are used, employers should observe environmental limits equivalent to a TWA concentration of 5 ppb, and a ceiling concentration of 20 ppb.  4. Environmental samples shall be collected and analyzed by the methods described in Appendix I, or by any other method at least equivalent in accuracy, precision, and sensitivity.	6. If monitoring shows that an employee is exposed to diisocyanates at concentrations above the recommended environmental limits, additional monitoring shall be promptly initiated.  7. If this confirms that exposure is excessive, control measures shall be initiated as soon as possible to reduce the concentration of diisocyanates in the employee's environment to less than or equal to the recommended PEL, and the affected employee shall be notified of the excessive exposure and of the control measures being implemented. Monitoring of the employee's exposure shall be conducted at least every 30 days and shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the appropriate PEL. At that point, semiannual monitoring may be resumed.	is a possibility that liquid diisocyanates may be present on floors.  5. Protective clothing and equipment shall be cleaned inside and out after each use. Rubbers shall be decontaminated and ventilated if they have become contaminated with diisocyanates. Contaminated leather articles shall be decontaminated or discarded.  <b>Eye protection</b> 6. The employer shall provide face shields (20 cm minimum) with goggles and shall ensure that employees wear the protective equipment during any operation in which splashes of liquid diisocyanates are likely to occur.  <b>Respiratory protection</b> 7. Compliance with the appropriate PEL by the use of respirators is permitted only during development, installation, and testing of engineering controls;						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>Diisocyanates (continued)</b></p>			<p>during performance of nonroutine maintenance or repair; when working in confined spaces; during spraying operations in the field; or during emergencies.</p> <p>8. When use of respirators is permitted, they shall be selected and used in accordance with Table I-1 and the employer shall ensure that the employees use them properly when required.</p> <p>9. The employer shall ensure that employees are properly instructed and drilled at least annually in the use of respirators assigned to them and on how to test for leakage, proper fit, and proper operation.</p> <p>10. Protective equipment suitable for emergency use shall be located at clearly identified stations outside the work area.</p> <p><b>Hygiene practices</b></p> <p>11. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>4-Dimethylaminoazobenzene</b> <b>(1910.1015, 11/78)</b>	<ol style="list-style-type: none"> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Decreased immuno-competence;</li> <li>Treatment with steroid or cytotoxic agents;</li> <li>Pregnancy;</li> <li>Cigarette smoking.</li> </ol> </li> <li>Personal, family, and occupational history, including: <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and all employees considered for assignment to enter regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
<b>4-Dimethylaminoazo- benzene</b> <b>(1910.1015)</b>		<div>1. A regulated area shall be established where 4-dimethylaminoazobenzene is manufactured, processed, used, repackaged, released, handled, or stored.</div> <div>2. Access shall be restricted to authorized personnel.</div>	<b>Protective clothing</b> <div>1. In operations involving "laboratory-type hoods," or where 4-dimethylaminoazobenzene is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirts and pants), shoe covers, and gloves prior to entering the regulated area.</div> <div>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for the purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</div>	<div>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</div> <div>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of 4-dimethylaminoazobenzene in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which 4-dimethylaminoazobenzene is present in each regulated area.</div> <div>3. Incidents resulting in release of 4-dimethylaminoazobenzene into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</div>	Yes	Yes	Yes	<div>1. Open vessel system operations are prohibited.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>4-Dimethylaminoazobenzene</b> (continued)			<p><b>Respiratory protection</b></p> <p>3. Employees engaged in 4-dimethylaminoazobenzene handling operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Dinitro-ortho-cresol (NIOSH 78-131, 2/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with special emphasis on any pre-existing disorders of:               <ol style="list-style-type: none"> <li>Lungs;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Thyroid gland;</li> <li>Nervous system;</li> <li>Cardiovascular system;</li> <li>Skin;</li> <li>Eyes.</li> </ol> </li> <li>Physical exam, with special attn to:               <ol style="list-style-type: none"> <li>Lungs;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Nervous system;</li> <li>Cardiovascular system;</li> <li>Skin;</li> <li>Eyes.</li> </ol> </li> <li>Clinical tests:               <ol style="list-style-type: none"> <li>Urinalysis, including microscopic exam;</li> <li>Complete blood count;</li> <li>Hematocrit;</li> <li>Liver function;</li> <li>Kidney function.</li> </ol> </li> <li>Ability to use positive and negative pressure respirators.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.1, 2, and 3.</li> </ol> <p><b>Biological monitoring</b></p> <ol style="list-style-type: none"> <li>Provide to all employees engaged in the following agriculturally related occupations: mixers, loaders, ground and aerial applicators, and flaggers.</li> <li>Weekly sampling and analysis of workers' blood for DNOC content during the period of expected exposure. Measurements shall be taken as close as feasible to, but no sooner than, 8 hrs after the weekly exposure ends.</li> <li>Any employee whose blood DNOC concentration exceeds 10 µg/g of whole blood shall be advised of this finding and surveys conducted to determine the cause of exposure, and controls implemented.</li> </ol>	<ol style="list-style-type: none"> <li>Retain medical records and biological monitoring data 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>In an emergency or at signs/symptoms of DNOC intoxication</b></p> <ol style="list-style-type: none"> <li>First aid.</li> <li>Prompt medical evaluation and care.</li> <li>Those with whole blood DNOC concentrations <math>\geq 20</math> µg/g should be removed from potential exposure to DNOC and placed under medical observation.</li> <li>Employee's return to work must be approved by responsible physician.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Dinitro-ortho-cresol (NIOSH 78-131, 2/78)	1. TWA: 0.2.  2. Procedures for the collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any other method shown to be at least equivalent in precision, accuracy, and sensitivity to the measures specified.	<b>Industrial hygiene survey</b>  1. Employers shall determine by an IH survey whether exposure to airborne DNOC is in excess of the action level.  2. Surveys shall be repeated at least once every yr and within 30 days of any process change likely to result in an increased concentration of airborne DNOC.  <b>Personal monitoring</b>  3. When the IH survey demonstrates that the environmental concentration of DNOC exceeds the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed to airborne DNOC.  4. Source and area monitoring may be used to supplement personal monitoring.  5. Each operation shall be sampled at least once every 3 mos or as otherwise indicated by a PIH.	<b>Protective clothing</b>  1. Any employee who engages in filling, pouring, mixing, formulating, loading, applying, or otherwise handling DNOC (including open-system manufacturing processes) shall be provided with protective head coverings, face shields (8 in minimum) with goggles, gloves, full-body coveralls, aprons, rainsuits, and footwear, and these shall be worn when needed to prevent skin contact with DNOC.  2. Gloves should have reverse gauntlets, and coveralls should be made of a closely woven fiber (nylon or cotton fabric is especially protective).  3. Employees handling sealed containers of DNOC shall be provided with and required to wear full-body coveralls and gloves.  4. Employees applying DNOC by closed-cockpit aircraft or by enclosed motor vehicles with	1. IH survey records shall be kept.  2. Records of environmental monitoring shall be kept for at least 30 yrs.  3. These records shall include the dates and times of measurements; duties and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; TWA concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names.  4. These records shall be made available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.	Yes	Yes	Yes	1. Occupational exposure = work in any area where DNOC is manufactured, formulated, processed, stored, or otherwise used.  2. Action level = 1/2 the recommended PEL.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Dinitro-ortho-cresol (continued)		5. Any employee whose blood DNOC concentration equals or exceeds 20 µg/g shall be removed from potential exposure and placed under medical observation.  6. Any employee removed from exposure shall not return until his blood level of DNOC is less than 20 µg/g, unless approved by responsible physician.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Dinitro-ortho-cresol (continued)</p>		<p>6. If exposure of an employee is found to be in excess of the TWA, the exposure of the employee shall be measured at least once every wk, controls initiated, and the employee notified of the exposure and of the controls being implemented. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that employee exposure no longer exceeds the recommended limit. Quarterly monitoring may then be resumed.</p>	<p>air-conditioned cabins shall be provided with gloves.</p> <p>5. Employees applying DNOC by open-cockpit aircraft shall be provided with and required to wear full-body coveralls, safety goggles, and gloves, and to carry a portable emergency eyewash bottle.</p> <p>6. Employees acting as flaggers (other than those flagging from enclosures) in the aerial application of DNOC shall be provided with and required to wear full-body coveralls or rainsuits, protective head and neck coverings, gloves, safety goggles, and footwear.</p> <p>7. Where toxic residues present a reasonable potential for exposure, employees entering areas treated with DNOC shall be provided with, and required to wear, gloves, full-body coveralls or rainsuits, face shields if foliage is likely to contact face, and footwear.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING</p>	<p>POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Dinitro-ortho-cresol (continued)</p>			<p>8. Employees, such as cleanup personnel, entering areas contaminated with DNOC shall be provided with, and required to wear, gloves, full-body coveralls or rainsuits, footwear, aprons, and such other personal protective equipment as may be required for adequate protection against the particular hazards presented.</p> <p>9. Clothing contaminated with DNOC shall be either disposed of or cleaned before reuse. Anyone handling contaminated clothing or responsible for its cleaning shall be instructed as to the hazards, relevant symptoms of over-exposure, appropriate emergency procedures, and proper conditions and precautions for the safe handling and use of DNOC.</p> <p>10. The employer shall ensure that all protective devices are inspected</p>						

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Dinitro-ortho-cresol (continued)</p>			<p>regularly and maintained in clean and satisfactory condition.</p> <p><b>Eye protection</b></p> <p>11. Safety glasses, chemical safety goggles, or face shields (8 in minimum) with goggles shall be provided by the employer and shall be worn during any operation in which DNOC may contact the eyes.</p> <p><b>Respiratory protection</b></p> <p>12. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided when necessary.</p> <p>13. The employer shall ensure that respirators are adequately cleaned and maintained and that employees are trained and drilled at least annually in the proper use and testing for leakage of respirators assigned to them.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Dinitro-ortho-cresol (continued)			14. Respirators shall be easily accessible, and employees shall be informed of their location.  <b>Hygiene practices</b> 15. Sanitation measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE</b> <b>(REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA</b> <b>STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC</b> <b>REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING</b> <b>REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Dioxane (NIOSH 77-226, 9/77)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, emphasizing disorders of:               <ol style="list-style-type: none"> <li>Upper respiratory system;</li> <li>Hepatic function;</li> <li>Renal function.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Nares;</li> <li>Hepatic function;</li> <li>Renal function.</li> </ol> </li> <li>Clinical tests, at least:               <ol style="list-style-type: none"> <li>Liver function test, e.g., SGOT, SGPT;</li> <li>Kidney function test, e.g., complete urinalysis.</li> </ol> </li> <li>Ability to use positive pressure respirator.</li> </ol>	<b>Annually</b> <ol style="list-style-type: none"> <li>Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Dioxane (NIOSH 77-226, 9/77)	1. Ceiling limit for 30 min: 3.6 (1).  2. Procedures for the sampling and analysis of workroom air shall be as provided in Appendices I and II, or by any method shown to be at least equivalent in sensitivity, accuracy, and precision.	1. A program of breathing zone or personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to dioxane.  2. Sufficient numbers of samples shall be collected and analyzed to permit construction of valid estimates of the exposures of employees during each workshift; the number of samples and concentration determinations shall be based on such factors as mobility and job functions of workers in that operation.  3. This sampling and analysis shall be conducted at least every 3 mos on at least 50% of the workers so that each worker's exposure is measured at least twice a yr; this frequency and fraction of employees sampled may be different if so directed by a PIH.  4. If monitoring of any employee shows exposure in excess of the recommended environmental limit, additional monitoring shall be promptly initiated.	Protective clothing  1. Protective clothing shall be worn in any operation in which the employee may come into direct contact with liquid dioxane.  2. The clothing shall be impervious to penetration and resistant to degradation by dioxane.  3. Neoprene-coated gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary.  4. Impervious supplied-air hoods or suits shall be worn when entering confined spaces, such as pits or tanks, unless known to be safe.  5. In situations where heat stress is likely to occur, air-supplied suits, preferably cooled, are recommended.  6. The employer shall ensure that all personal protective clothing is inspected regularly for defects and is maintained in a clean and satisfactory condition by the employee.	1. Environmental monitoring records shall be maintained for at least 30 yrs.  2. These records shall include methods of sampling and analysis used, types of respiratory protection used, and concentrations found.  3. Each employee shall be able to obtain information on his or her own environmental exposures.  4. Environmental records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = work in any area where dioxane is handled, manufactured, or otherwise used, except where it is present as an unintentional contaminant in other chemical substances at less than 1% by weight or where it is only stored in leakproof containers.	

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b>  $\text{mg}/\text{m}^3$ (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Dioxane (continued)</b>		5. If confirmed, control procedures shall be instituted as soon as possible; these may precede and obviate confirmatory monitoring if the employer desires. Affected employees shall be advised that exposures have been excessive and be notified of the control procedures being implemented. Monitoring of these employees' exposures shall be conducted at least as often as every 30 days and shall continue until 2 successive samplings at least 1 wk apart confirm that exposure no longer exceeds the permissible limit. Normal monitoring may then be resumed.	<b>Eye protection</b>  7. Eye protection shall be provided to, and worn by, each employee engaged in an operation in which dioxane, liquid or spray, may enter the eye. Chemical-type goggles, safety glasses with splash shields or plastic face shields (8 in minimum) made completely of dioxane-resistant material shall be used.  <b>Respiratory protection</b>  8. The employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator in a proper manner when the concentration of airborne dioxane exceeds the recommended concentration limit.  9. The employer shall ensure that chemical cartridges and canisters are not used with dioxane except for evacuation or escape.  10. The employer shall ensure that respirators are adequately cleaned,						

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Dioxane</b> <b>(continued)</b>			maintained, and stored, and that employees are instructed and drilled, at least annually, in the proper use and testing of respirators assigned to them.  <b>Hygiene practices</b> 11. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Elevated work stations (emergency egress from) (NIOSH 76-128, 1976)	<ol style="list-style-type: none"> <li>Medical and work histories.</li> <li>If work at &lt;80 ft but &gt;15 ft: <ol style="list-style-type: none"> <li>Depth perception;</li> <li>Fields of vision;</li> <li>Reaction time;</li> <li>Manual dexterity;</li> <li>Coordination;</li> <li>Abnormal tendency toward dizziness.</li> </ol> </li> <li>If work at &gt;80 ft: <ol style="list-style-type: none"> <li>Visual acuity to ensure at least 20/30 Snellen in one eye and 20/50 in the other (correct with lenses if necessary);</li> <li>Color perception;</li> <li>Hearing tests, with or w/o aids (to ensure at least 15/20 in one ear; or a hearing loss of ≤20 db in normally tested frequencies);</li> <li>Strength;</li> <li>Endurance;</li> <li>Agility;</li> <li>Coordination;</li> <li>Speed of reactions;</li> <li>Beware of: <ol style="list-style-type: none"> <li>Cardiovascular diseases;</li> <li>Epilepsy;</li> <li>Diabetes;</li> <li>Emotional instability.</li> </ol> </li> </ol> </li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain pertinent medical records and ensure they are available for review during the term of employment.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Elevated work stations (emergency egress from) (NIOSH 76-128, 1976)		<div>1. All egress facilities shall be inspected and maintained as often as is necessary to ensure that they are clearly accessible and in proper operating condition. Such inspections shall consider weather, exposure to corrosive atmospheres, and other adverse conditions which could affect the operation of the equipment.</div> <div>2. All alarm and communication systems and components shall be tested as often as is necessary to ensure that they are in reliable operating condition.</div>		<div>1. Records shall be retained at least 3 yrs from the date of training, inspection, test, or maintenance.</div> <div>2. Includes training drills, inspections, tests, and maintenance operations.</div> <div>3. Shall be available to DR of the Sec. of HHS and of the Sec. of Labor.</div>	Yes	Yes	Yes	<div>1. Means of egress = a method of access to a separate area that is safe or leads to a safe place.</div>	



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Epichlorohydrin (NIOSH 76-206, 9/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Complete physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Kidneys;</li> <li>b. Liver;</li> <li>c. Respiratory tract;</li> <li>d. Hematopoietic system;</li> <li>e. Complaints and evidence of eye, mucous membrane, and skin irritations.</li> </ol> </li> <li>3. As DBRP: <ol style="list-style-type: none"> <li>a. SGPT and SGOT;</li> <li>b. Lactic dehydrogenase.</li> </ol> </li> <li>4. Ability to use respirators.</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after last occupational exposure for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If overexposed</b></p> <ol style="list-style-type: none"> <li>1. First aid.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Epichlorohydrin (NIOSH 76-206, 9/76)	1. TWA: 2 (0.5).  2. Ceiling limit for 15 min: 9 (~5.0).  3. Procedures for sampling and analysis of environmental samples and calibration of equipment shall be as provided in Appendices I and II, or by any methods shown to be at least equivalent in accuracy, sensitivity, and precision to the methods specified.	<b>Industrial hygiene survey</b>  1. Workers will not be considered to have occupational exposure to epichlorohydrin if the environmental concentrations, as determined by an IH survey, do not exceed 1/2 the TWA.  2. Surveys shall be repeated at least once every 3 mos and within 30 days after any process change likely to result in increases of airborne concentrations of epichlorohydrin.  <b>Personal monitoring</b>  3. If the IH survey indicates that airborne concentrations of epichlorohydrin exceed the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees who are occupationally exposed to epichlorohydrin.  4. <i>Interim monitoring</i> of employee exposure to airborne concentrations of epichlorohydrin shall be conducted at least every 3 mos.	<b>Protective clothing</b>  1. Aprons, suits, boots, and face shields shall be worn when needed to prevent skin contact with liquid epichlorohydrin.  2. All such clothing shall be made of impervious material, such as polyethylene, polypropylene, or polyvinyl chloride. Neoprene, rubber, or leather is unsuitable.  <b>Eye protection</b>  3. Chemical safety goggles and face shields shall be worn during any operation in which epichlorohydrin may splash into the eyes.  <b>Respiratory protection</b>  4. When permissible, <i>respirators shall be selected</i> in accordance with Table I-1, and shall ensure that the employee uses the respirator provided.  5. Where an emergency which could result in employee injury from overexposure to epichlorohydrin may develop, the employer shall provide respiratory protection as listed in Table I-1.	1. IH survey records shall be maintained.  2. Records shall be maintained and shall include sampling and analytical methods, type of respiratory protective devices used, and TWA and ceiling concentrations found.  3. Each employee shall be able to obtain information on his or her own environmental exposures.  4. Records of occupational accidents and environmental exposures within the workplace shall be maintained for 20 yrs after the worker's last occupational exposure to epichlorohydrin.  5. Shall be available to DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne epichlorohydrin at concentrations exceeding the action level.  2. Action level = 1/2 the PEL	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Epichlorohydrin (continued)</b>		<b>5. If monitoring of an employee's exposure to epichlorohydrin reveals that the employee is exposed at concentrations in excess of the recommended TWA environmental limit, the exposure of that employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented to correct the situation. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the TWA. Quarterly monitoring may then be resumed.</b>	<b>Hygiene practices</b> <b>6. Sanitation measures specified.</b>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ethylene dibromide (NIOSH 77-221, 8/77)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, emphasizing disorders of:               <ol style="list-style-type: none"> <li>a. Heart;</li> <li>b. Liver;</li> <li>c. Kidneys;</li> <li>d. Central nervous system.</li> </ol> </li> <li>2. Comprehensive physical exam, emphasizing:               <ol style="list-style-type: none"> <li>a. Cardiovascular system;</li> <li>b. Pulmonary system;</li> <li>c. Neurologic system;</li> <li>d. Hepatic system;</li> <li>e. Renal system;</li> <li>f. Skin exam.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> 1. Same as in A.	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all persons employed in work involving exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.</li> </ol>	<ol style="list-style-type: none"> <li>1. If suspected of exposure to EDB at or above the action level or to liquid EDB:               <ol style="list-style-type: none"> <li>a. Prompt medical care.</li> <li>b. 48-hr observation period for delayed systemic or dermal effects.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Ethylene dibromide (NIOSH 77-221, 8/77)	1. Ceiling limit for 15 min: 1.0 (0.13).  2. Procedures for the collection and analysis of workroom air samples for compliance with the standard shall be as provided in Appendices I and II, or by any methods shown to be at least equivalent in precision, sensitivity, and accuracy to the methods specified.	1. IH surveys shall be made in any workplace where ethylene dibromide is handled, processed, or stored.  2. Surveys shall be repeated every month or whenever a process change is made.  3. Where concentrations of ethylene dibromide have been determined to be at or above the action level, sampling shall be continued monthly to determine the occupational exposure of employees.  4. Environmental samples shall be taken when a new process is installed or process changes are made which may cause an increase in environmental concentrations. Signifi- cantly increased production, relocation of existing operations, interruption of normal maintenance schedules, or other functions which may increase ethylene dibromide concentrations shall require resampling and analysis.	Protective clothing  1. Protective clothing shall be resistant to the penetration and to the chemical action of ethylene dibromide.  2. Additional protection, including gloves, bib-type aprons, boots, and overshoes, shall be provided for, and worn by, each employee while in any operation that may cause direct contact with liquid ethylene dibromide.  3. Supplied-air hoods or suits resistant to penetration by ethylene dibromide shall be worn when entering confined spaces, such as pits or storage tanks.  4. In situations where heat stress is likely to occur, supplied-air suits, preferably cooled, are recommended.  5. The employer shall ensure that all protective clothing is inspected regularly for defects and is maintained in a clean and satisfactory condition by the employee.	1. Records of IH surveys shall be maintained.  2. Employers or their successors shall maintain records which shall include sampling and analytical methods, types of respiratory protection used, concentrations found, and information concerning exposure of employees to ethylene dibromide.  3. Each employee shall be able to obtain information on his or her own environmental exposures.  4. Pertinent records of occupational accidents and environmental exposures within the workplace shall be kept for at least 30 yrs after the worker's employment has ended.  5. Shall be available to DR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.	Yes	Yes	Yes	1. Occupational exposure = work in any establishment where ethylene dibromide is manufactured, blended, stored, used, handled, or otherwise present.  2. Action level = 1/2 the recommended PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELLING</b>	<b>POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ethylene dibromide (continued)</b>		<p>5. The minimum number of representative exposure determinations for an operation or process shall be based on variations in exposures and production schedules.</p> <p>6. If initial, periodic, or special evaluations indicate that the recommended limit is exceeded, corrective engineering or other control measures shall be immediately instituted to ensure the safety of employees until a concentration below the recommended occupational exposure limit is achieved. In such cases, sampling of each operation and work location shall be conducted at least weekly until 2 consecutive employee exposure measurements, taken at least 1 wk apart, reveal that the employee is not exposed to ethylene dibromide above the recommended occupational exposure limit. Employers shall notify in writing, within 5 days, every employee who is</p>	<p><b>Eye protection</b></p> <p>6. Eye protection devices shall be provided by the employer and used by each employee where contact of ethylene dibromide with the eyes is likely.</p> <p>7. Chemical safety goggles or plastic face shields (8 in minimum) with goggles made completely of ethylene dibromide-resistant materials shall be used.</p> <p><b>Respiratory protection</b></p> <p>8. When a respirator is permitted, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employer uses the respirator provided when necessary.</p> <p>9. The employer shall ensure that chemical cartridges are not used with ethylene dibromide except for evacuation or escape because of the poor warning properties of ethylene dibromide at the recommended occupational exposure limit.</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Ethylene dibromide (continued)		found to be exposed to ethylene dibromide above the recommended environmental limit.	10. The employer shall ensure that respirators are adequately cleaned and maintained, and that employees are instructed and drilled, at least annually, in the proper use and testing for leakage of respirators assigned to them.  <b>Hygiene practices</b> 11. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ethylene dichloride (NIOSH 78-211, 9/78)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on:               <ol style="list-style-type: none"> <li>a. Respiratory system;</li> <li>b. Cardiovascular system;</li> <li>c. Hepatic function;</li> <li>d. Renal function.</li> </ol> </li> <li>2. Comprehensive physical exam.</li> <li>3. Ability to use positive pressure respirator.</li> </ol>	<b>Annually</b> 1. Same as in A.1 and 2.	<ol style="list-style-type: none"> <li>1. Retain at least 30 yrs after termination of employment for all employees exposed at or above the action level.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Ethylene dichloride (NIOSH 78-211, 9/78)	1. TWA: 4 (1). 2. Ceiling limit for 15 min: 8 (2). 3. Procedures for sampling and analysis of workroom air for compliance with the standard shall be as provided in Appendices I and II, or by any equivalent method.	1. Where it has been determined that the environmental concentrations do not result in TWA workday exposures above 1/2 the TWA environmental limit, environmental monitoring shall not be required. 2. Exposure surveys shall be made when any process change indicates the need for reevaluation or at the discretion of the compliance officer. 3. Where it has been determined that environmental concentrations result in TWA workday exposures above 1/2 the PEL, employers shall conduct environmental sampling at least quarterly. 4. Environmental samples shall be taken when a new process is installed or when process changes are made which may cause an increase in environmental concentrations. Increased production, relocation of existing operations, or other functions which can increase concentrations shall require resampling.	<b>Protective clothing</b> 1. In any operation where the worker may come into direct contact with liquid ethylene dichloride, protective clothing shall be worn. 2. The clothing shall be both impervious and resistant to ethylene dichloride. 3. Gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary. 4. Impervious supplied-air hoods or suits shall be worn when entering confined spaces such as pits or tanks unless known to be safe. 5. In situations where heat stress is likely to occur, air-supplied suits shall be used. 6. All protective clothing shall be well-aired and inspected for defects prior to reuse.  <b>Eye protection</b> 7. Eye protection shall be provided for, and worn by, any employee	1. Records which form the basis for concluding that the exposures are at or below 1/2 the PEL shall be maintained. 2. Sampling records shall be maintained for at least 20 yrs after the individual's employment is terminated. 3. Shall indicate the type of personal protective devices, if any, in use at the time of sampling. 4. Each employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Occupational exposure = exposure above 1/2 the TWA.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION							
Ethylene dichloride (continued)		<p>5. In all monitoring, samples shall be collected which are representative of breathing zone exposures characteristic of each job or specific operation in each work area.</p> <p>6. The minimum number of representative TWA exposure determinations for an operation or process shall be based on variation in exposures and production schedules considering the number of workers exposed as suggested in the table below, or as otherwise indicated by a PIH.</p> <table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table> <p>7. When exposure levels are found to be greater than the recommended PEL, environmental concentrations shall be reduced</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>engaged in any operation where ethylene dichloride liquid or spray may enter the eye.</p> <p>8. Chemical-type goggles, safety glasses with splash shields, or plastic face shields made completely of ethylene dichloride-resistant materials shall be used.</p> <p><b>Respiratory protection</b></p> <p>9. The employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>10. Because of the poor warning properties of ethylene dichloride at the environmental limit, chemical cartridges and canisters shall not be used with ethylene dichloride except for evacuation or escape.</p> <p>11. Where an emergency may develop that could result in employee injury from overexposure to ethylene dichloride, the employer shall provide respiratory protection as listed in Table I-1.</p>					
Number of Employees Exposed	Number of TWA Determinations															
1-20	50% of the number of workers															
21-100	10 plus 25% of the excess over 20 workers															
> 100	30 plus 5% of the excess over 100 workers															

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Ethylene dichloride (continued)		by suitable engineering controls. Exposures shall be monitored at least weekly until the effectiveness of the controls is established.	<b>Hygiene practices</b> 12. Sanitation measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ethylene oxide (ETO) (NIOSH 77-200, 8/77) [Special Health Hazards Review]	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with special emphasis on symptoms in:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Blood;</li> <li>Lungs;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Nervous system;</li> <li>Skin.</li> </ol> </li> <li>Comprehensive physical exam, with emphasis on:               <ol style="list-style-type: none"> <li>Pulmonary system;</li> <li>Neurologic system;</li> <li>Hepatic system;</li> <li>Renal system;</li> <li>Ophthalmologic system;</li> <li>Skin.</li> </ol> </li> <li>Complete blood count, including white cell count, differential count, hemoglobin, and hematocrit.</li> </ol>	Annually, and more frequently, as DBRP 1. Same as in A.1 and 2.	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after termination of employment.</li> <li>Include full name of employee, all information obtained from medical examinations which is pertinent to ETO exposure, any complaints by the employee relatable to exposure to ETO, and any treatments for exposure to ETO, and the results of that treatment.</li> <li>Update at least annually.</li> <li>Shall be available to DMR of the Assistant Sec. of Labor for OSHA and the Director of NIOSH.</li> <li>Shall be available upon written request to a physician designated by the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

## WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ethylene thiourea (ETU) (NIOSH 79-109, 10/78) [Special Health Hazards Review]	1. Special attention should be paid to the function of the thyroid.  2. It is recommended that a pre-exposure baseline be determined for thyroid-stimulating hormone, thyroxine, and triiodothyronine.	At least annually, or as DBRP	No requirements specified.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE</b> <b>(REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA</b> <b>STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Ethyleneimine</b> <b>(1910.1012, 11/78)</b>	1. Physical exam, with attn to: a. Decreased immuno-competence; b. Treatment with steroid or cytotoxic agent; c. Pregnancy; d. Cigarette smoking.  2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	<b>Annually</b> 1. Same as in A.	1. Retain for the duration of employment for all authorized employees and all employees considered for assignment to enter regulated areas.  2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.  3. Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.  4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Ethyleneimine (1910.1012)		<div>1. A regulated area shall be established where ethyleneimine is manufactured, processed, used, repackaged, released, handled, or stored.</div> <div>2. Access shall be restricted to authorized personnel.</div>	<div>Protective clothing</div> <div>1. In operations involving "laboratory-type hoods," or where ethyleneimine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</div> <div>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</div>	<div>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</div> <div>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of ethyleneimine in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which ethyleneimine is present in each regulated area.</div> <div>3. Incidents resulting in release of ethyleneimine into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</div> <div>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of</div>	Yes	Yes	Yes	<div>1. Open vessel system operations are prohibited.</div>

## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ethyleneimine (continued)</b>			<b>Respiratory protection</b> 3. Employees engaged in ethyleneimine handling operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a full-face, supplied air respirator, of the continuous flow or pressure demand type, in accordance with 1910.134.  <b>Hygiene practices</b> 4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.	time involved, and an explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fibrous glass (NIOSH 77-152, 4/77)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>Acute or chronic skin condition;</li> <li>Pulmonary disease;</li> <li>Prior exposure to dusty occupations (silica, coal dust, asbestos).</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Respiratory system;</li> <li>Other tests for:                   <ol style="list-style-type: none"> <li>Dermographism;</li> <li>Pulmonary function (FVC, FEV1.0), as DBRP;</li> <li>Eye exam, as DBRP.</li> </ol> </li> </ol> </li> <li>If exposed to fibers <math>&lt;3.5 \mu\text{m}</math> at levels above action level:               <ol style="list-style-type: none"> <li>Chest X-ray;</li> <li>Pulmonary function tests (FEV1.0, FVC);</li> <li>Other tests related to detection of chronic lung disease, including tuberculosis.</li> </ol> </li> <li>Ability to use positive and negative pressure respirators, and ability to function under partial oxygen deprivation.</li> </ol>	At least annually, or as DBRP 1. Same as in A.1, 2, and 3.	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Fibrous glass (NIOSH 77-152, 4/77)	<p>1. TWA: 3,000,000 fibers/m<sup>3</sup> with a diameter equal to or less than 3.5 µm, and a length equal to or greater than 10 µm.</p> <p>2. TWA (determined as total fibrous glass): 5.</p> <p>3. Sampling in the work en- vironment shall be performed by the method provided in Appendices I and II, or by other methods with at least equivalent efficiency. Samples shall be analyzed by the methods provided in Appendices II and IV, or by methods demonstrated to be at least equivalent in</p>	<p>Industrial hygiene survey</p> <p>1. Each employer who has a place of employment in which there is occupational exposure to fibrous glass shall determine by an IH survey whether exposure may occur above the action level.</p> <p>2. Surveys shall be repeated at least once every 3 yrs and within 30 days of any process change likely to result in an increase of airborne fibrous glass concentrations.</p> <p>Personal monitoring</p> <p>3. A program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to fibrous glass above the action level.</p> <p>4. Shall be conducted every 3 mos on at least 25% of the workers so that each worker's exposure is measured at least every year; the frequency of sampling and the fraction of employees sampled may be different if so directed by a PIH.</p>	<p>Protective clothing</p> <p>1. Protective clothing shall be worn to prevent fibrous glass contact with skin, hands, arms, neck, and underarms.</p> <p>Eye protection</p> <p>2. Safety goggles or face shields shall be worn during tear-out or blowing operations or when applying fibrous glass materials overhead. They should be used in all areas where there is a likelihood that airborne glass fibers may contact the eyes.</p> <p>Respiratory protection</p> <p>3. Respirators shall be used for compliance with the PEL only during the time necessary to install or test required engineering controls; or in situations such as during the performance of nonroutine construction, demolition, maintenance, or repair activities when air concen- trations of fibrous glass may exceed the PEL. Respiratory protection is necessary in those operations where high</p>	<p>1. IH survey records shall be maintained.</p> <p>2. Records of environmental monitoring shall be maintained for at least 30 yrs after termination of employment.</p> <p>3. Shall include the dates of environmental measure- ments; job function and location of the employee within the worksite at time of sampling; sampling and analytical methods used and evidence of their accuracy, number, duration, and results of samples taken; TWA determinations based on these samples; type of personal protective equipment in use, if any; name of the employee being monitored; dates of employment with the company; and information regarding changes in job assignment.</p> <p>4. Each employee shall be able to obtain information on his or her own environmental exposures.</p> <p>5. Shall be available to DR of the Sec. of Labor and of the Sec. of HHS.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = exposure to airborne fibrous glass above the action level.</p> <p>2. Action level = 1/2 the TWA.</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Fibrous glass (continued)</b>	accuracy, precision, and sensitivity.	<ol style="list-style-type: none"> <li>5. If an employee is found to be exposed in excess of the recommended TWA, additional monitoring shall be promptly initiated.</li> <li>6. If excessive exposure is confirmed, control procedures shall be instituted as soon as possible; these may precede and obviate confirmatory monitoring if the employer desires.</li> <li>7. The employee shall be notified of the exposure and of the controls being implemented.</li> <li>8. The exposure of that employee shall be measured at least once every 30 days. This shall continue until 2 consecutive determinations, at least 1 wk apart, confirm that the employee's exposure no longer exceeds the PEL. Normal monitoring may then be resumed.</li> </ol>	<p>volumes of dust are generated and where adherence to the PELs cannot be achieved by engineering controls.</p> <ol style="list-style-type: none"> <li>4. When wearing of respirators is permitted, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator in a proper manner.</li> <li>5. The employer shall ensure that employees are properly instructed at least annually through training and drills on the use of respirators assigned to them and on how to test for leakage, proper fit, and proper operation.</li> </ol> <p><b>Hygiene practices</b></p> <ol style="list-style-type: none"> <li>6. Sanitation measures specified.</li> </ol>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE</b> <b>(REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA</b> <b>STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fluorides (inorganic) (NIOSH 76-103, 6/75)	<ol style="list-style-type: none"> <li>Medical exam, with emphasis on:               <ol style="list-style-type: none"> <li>Musculoskeletal;</li> <li>Pulmonary;</li> <li>Gastrointestinal;</li> <li>Kidneys;</li> <li>Moderate-to-severe osteosclerosis;</li> <li>Radiological exam of male pelvis, with gland shielding;</li> <li>Urinalysis (for fluoride levels).</li> </ol> </li> <li>Use of respirators.</li> </ol>	<b>Every 2 yrs</b> <ol style="list-style-type: none"> <li>Same as in A, except for A.1.f.</li> </ol> <b>Every 6 yrs</b> <ol style="list-style-type: none"> <li>Same as in A.1.f.</li> </ol> <b>Biological monitoring</b> <ol style="list-style-type: none"> <li>Urinary postshift F analysis shall be made available every 3 mos to at least 1/4 of all exposed workers.</li> <li>Spot urine samples shall be collected at the end of the work shift after 4 or more consecutive days of exposure.</li> <li>Urinary preshift F analysis shall be made available to all exposed workers at least annually.</li> <li>Preshift spot samples shall be collected at the start of the work shift at least 48 hrs after a previous occupational exposure. Results shall be corrected for a specific gravity of 1.024.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for duration of employment plus 20 yrs for all employees subject to exposure.</li> <li>Medical records, including information on all biological determinations, shall be available to DMR of the employer, of the Sec. of Labor, of the Sec. of HHS, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>Biological monitoring as specified in pp. 3-4 of Reference. To be done every 3 mos on at least 1/4 of all exposed workers.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<p align="center"><b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b></p>	<p align="center"><b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b></p>	<p align="center"><b>MONITORING REQUIREMENTS</b></p>	<p align="center"><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p align="center"><b>RECORDKEEPING REQUIREMENTS</b></p>	<p align="center"><b>TRAINING</b></p>	<p align="center"><b>LABELLING POSTING</b></p>	<p align="center"><b>PRACTICES WORK</b></p>	<p align="center"><b>ADDITIONAL INFORMATION</b></p>
<p><b>Fluorides (inorganic) (NIOSH 76-103, 6/75)</b></p>	<ol style="list-style-type: none"> <li>1. TWA: 2.5.</li> <li>2. Procedures for sampling, calibration of equipment, and analysis of fluoride samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Work areas shall not be considered to have fluoride exposure if work area air levels, as determined on the basis of an IH survey or by the judgment of a compliance officer, do not exceed 1/2 of the environmental limit.</li> <li>2. Surveys shall be repeated when any process change indicates a need for re-evaluation or when in the judgment of the compliance officer it is deemed necessary.</li> <li>3. In areas in which there is fluoride exposure, samples representative of the exposure in the breathing zone of employees shall be collected.</li> <li>4. An adequate number of samples shall be collected to characterize every operation or process.</li> <li>5. The minimum number of representative workshift TWA determinations for an operation or process shall be based on the number of</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. The type of protective clothing required will be dictated by the chemical nature and the physical form of the fluorides present and the duration and magnitude of worker exposure.</li> <li>2. Such protective clothing may include coveralls, shoe covers, caps, gloves, and goggles.</li> <li>3. Persons working with acidic solutions of fluorides shall wear impervious gloves, shoe covers or boots, and aprons. Unless eye and face protection is afforded by respiratory protection, chemical goggles and face shields shall be worn. Before removing protective clothing the worker shall rinse off fluoride solutions with water.</li> <li>4. All protective clothing and equipment shall be maintained in a clean, sanitary, and workable condition.</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained until a new survey is completed.</li> <li>2. Records of all sampling shall be maintained for the duration of employment plus 20 yrs.</li> <li>3. Shall be maintained so that exposure information is available for individual employees.</li> <li>4. Shall indicate the type of personal protective devices, if any, in use at the time of sampling.</li> </ol>	<p align="center">Yes</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to fluorides above 1/2 the TWA.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fluorides (inorganic) (continued)		7. If a postshift urinary F level exceeds 7.0 mg/l, preshift spot urine samples shall be col- lected within 2 wks at the start of a work shift at least 48 hrs after a previous occupational exposure and a repeat postshift spot sample shall be collected at the conclusion of the work shift. This shall be done at the end of the work- week in which the preshift sample is collected. If the F level of the second sample is above either the preshift limit of 4.0 mg/l or the postshift limit of 7.0 mg/l, steps shall be taken to evaluate dietary sources, per- sonal hygiene, basic work practices, and environmental controls.  8. In case the group median (job classifica- tion) postshift urinary		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION							
Fluorides (inorganic) (continued)		<p>workers exposed, as seen in the table below.</p> <table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table> <p>6. Samples shall be collected at least semiannually or within 30 days after first operation of a new process or any process changes.</p> <p>7. Monitoring of an operation or process shall be repeated within 1 mo when the fluoride concentration has been found to exceed the recommended environmental limit. When the results of the repeat survey reveal a concentration in excess of the limit, suitable controls shall be initiated and monitoring shall continue at monthly intervals until the adequacy of these controls has been demonstrated.</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p><b>Respiratory protection</b></p> <p>5. When a respirator is permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p><b>Hygiene practices</b></p> <p>6. Sanitation measures specified.</p>					
Number of Employees Exposed	Number of TWA Determinations															
1-20	50% of the number of workers															
21-100	10 plus 25% of the excess over 20 workers															
> 100	30 plus 5% of the excess over 100 workers															



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fluorides (inorganic) (continued)		F levels exceed 7.0 mg/l, they shall be performed monthly until the cause of the elevated urinary F has been corrected as demonstrated by a return of the group median to a value not exceeding 70 mg/l.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Fluorides (inorganic)</b> <b>(continued)</b>		<p>8. Monitoring of an operation or process shall also be repeated when group median biological monitoring reveals urinary fluoride excretion above the postshift level of 7.0 mg/liter, adjusted to a specific gravity of 1.024.</p> <p>Monitoring of the work environment in response to high postshift urinalyses should be conducted on the same day as the repeat postshift urinalysis.</p>							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Fluorocarbon polymers (decomposition products of) (NIOSH 77-193, 9/77)	1. Comprehensive medical and work histories.  2. Physical exam, with attn to: a. Respiratory system.  3. Ability to use negative or positive pressure respirator.	<b>As DBRP</b> 1. Not specified.	1. Retain 30 yrs after termi- nation of employment for all employees exposed.  2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee/former employee.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Fluorocarbon polymers</b> (decomposition products of) (NIOSH 77-193, 9/77)	Insufficient information to establish standard.		<b>Protective clothing</b> 1. Where bulk fluorocarbon polymer dust is handled, or where contact of the powdered polymer with the skin is likely, gloves and coveralls or equivalent clothing shall be used.  2. Respiratory protective equipment to be used, if necessary, during emergencies or during the performance of nonroutine maintenance or repair activities in which exposure to the decomposition products of fluorocarbon polymers is likely should be provided in accordance with Table I-1.  <b>Hygiene practices</b> 3. Sanitation measures specified.		Yes	Yes	Yes	1. Vacuum up spills when possible.

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Formaldehyde (NIOSH 77-126, 12/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Chronic inflammatory reaction of the respiratory tract;</li> <li>b. Chronic inflammatory reaction of the skin;</li> <li>c. Hypersensitivities or other allergies, e.g., asthma, hayfever, rose fever.</li> </ol> </li> <li>2. Ability to use positive or negative pressure respirator.</li> </ol>	Not mentioned	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If overexposed</b> <ol style="list-style-type: none"> <li>1. Physical exam as in A.1 within a reasonable period of time.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Formaldehyde (NIOSH 77-126, 12/76)	<ol style="list-style-type: none"><li>1. Ceiling limit for 30 min: 1.2 (1).</li><li>2. Methods for calibration of equipment, air sampling, and analysis for formaldehyde shall be as provided in Appendices I and II, or by any procedure shown to be equivalent in precision, accuracy, and sensitivity to the procedures specified.</li></ol>	<ol style="list-style-type: none"><li>1. Workroom areas shall not be considered to have formaldehyde exposure if airborne concentrations of formaldehyde, as determined on the basis of annual IH surveys, do not exceed a ceiling concentration of 1.2 mg/cu m (1 ppm) and if there is no occupational exposure to formaldehyde solutions.</li><li>2. Where formaldehyde exposure exists, workplace environmental surveys shall be conducted.</li><li>3. Workplace environmental surveys shall be conducted within 30 days after installation of a new process or any process changes.</li><li>4. Should environmental sampling indicate airborne formaldehyde concentrations between 1/2 of the ceiling concentration limit and the ceiling concentration limit, the following requirements shall apply: Samples shall be collected at least semiannually for the evaluation of the workplace environment with respect to the</li></ol>	<p>Protective clothing</p> <ol style="list-style-type: none"><li>1. When necessary, protective equipment and clothing shall be furnished to employees or shall be readily available at convenient and appropriate locations.</li><li>2. Employees shall wear gloves made of rubber or of other impervious material when working with formaldehyde and when contact with the hands is likely.</li><li>3. Employees shall wear protective sleeves, aprons, jackets, trousers, and caps as needed to protect them from skin contact with formaldehyde. Protective garments shall be made of a material impervious to formaldehyde. In emergencies or other circumstances involving exposure to formaldehyde at high concentrations of vapor, mists, or dusts in the air, full-body protection shall be worn. Emergency garments shall be of an impervious material, and shall fit snugly about the wrists, neck, and ankles.</li></ol>	<ol style="list-style-type: none"><li>1. IH survey records shall be maintained.</li><li>2. Records of all sampling and analysis of airborne concentrations of formaldehyde shall be retained for at least 5 yrs.</li><li>3. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling.</li><li>4. Records shall be maintained and classified so that an employee shall be able to obtain information about his or her own present and past workplace exposures to formaldehyde.</li><li>5. All records required to be maintained by this section shall be made available upon request to DR of the Assistant Sec. of Labor for OSHA and to the Director of NIOSH.</li><li>6. Employee exposure determination and exposure measurement records required to be maintained shall be made available to employees and their DR.</li></ol>	Yes	Yes	Yes	<ol style="list-style-type: none"><li>1. Occupational exposure = exposure to formaldehyde at a concentration in excess of 0.6 mg/m<sup>3</sup>.</li></ol>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G P O S T I N G</b>	<b>P R A C T I C E S W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Formaldehyde (continued)</b>		<p>recommended standard. Each employee or employee location shall be evaluated at least once every yr.</p> <p>5. When employee exposure exceeds the 30-min ceiling limit, environmental controls shall be applied. Monitoring and record-keeping shall be repeated on a weekly basis until 2 consecutive sampling periods have demonstrated that corrective measures have decreased airborne formaldehyde concentrations at or below the limit.</p> <p>6. Without interfering with the measurement, observers shall be entitled to receive an explanation of the measurement procedure, visually observe all steps related to the measurements that are being performed at the place of exposure, and record the results obtained.</p>	<p>4. Employees handling drums, cans, or other containers of formaldehyde shall wear leather or rubber safety shoes as protection from splashes or spills of formaldehyde.</p> <p>5. Protective garments shall be cleaned inside and out and well ventilated after each use, and particularly after contamination has occurred.</p> <p><b>Eye protection</b></p> <p>6. Cup-type or rubber-framed chemical safety goggles shall be worn by employees when there is any possibility of eye or facial contact with formaldehyde solutions. Goggles also protect eyes from contact with gas. In cases of excessive vapor concentrations, a full-face mask respiratory protective device shall be required; this device may be substituted for cup-type or rubber-framed chemical safety goggles.</p> <p>7. Full-length, plastic face shields shall be required in addition to safety goggles for face</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Formaldehyde (continued)			<p>protection when the work process involves risks of exposure to splashes of formaldehyde. Chemical safety goggles are required in addition to the face shield when there is danger of formaldehyde entering underneath or around the sides of the shield.</p> <p>8. The safety goggles, full-face masks, and shields shall be thoroughly decontaminated after each use.</p> <p><b>Respiratory protection</b></p> <p>9. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator properly.</p> <p>10. Use of chemical cartridges and canisters more than once or for a period greater than that indicated in Table I-1 shall be prohibited.</p> <p>11. Emergency equipment shall be located at well-marked and identified stations and shall be adequate to the needs</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Formaldehyde (continued)</p>			<p>of all employees, either to escape from the area or to safely cope with the emergency.</p> <p>Hygiene practices</p> <p>12. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Furfuryl alcohol (NIOSH 79-133, 3/79)	<ol style="list-style-type: none"> <li>Medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>Upper respiratory tract;</li> <li>Skin.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Eyes;</li> <li>Respiratory system.</li> </ol> </li> <li>Ability to use positive or negative pressure respirator.</li> </ol>	<b>As DBRP</b> <ol style="list-style-type: none"> <li>Interim medical and work histories.</li> <li>Same as in A.2.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after last occupational exposure.</li> <li>Include copies of applicable exposure data.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If overexposed</b> <ol style="list-style-type: none"> <li>First aid and prompt medical attention.</li> <li>Flush with copious amounts of water if skin or eye contact.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS.	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Furfuryl alcohol (NIOSH 79-133, 3/79)	1. TWA: 200 (50).  2. Procedures for the collection and analysis of environmental samples shall be as provided in the appendix, or by any other methods at least equivalent in precision, accuracy, and sensitivity to the methods specified.	Industrial hygiene survey  1. Employers shall determine by an IH survey whether there is occupational exposure to furfuryl alcohol.  2. Surveys shall be repeated at least annually and within 30 days of any process change likely to result in an increased concentration of airborne furfuryl alcohol.  Personal monitoring  3. If there is occupational exposure to furfuryl alcohol, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee occupationally exposed.  4. Source and area monitoring may be a useful supplement to personal monitoring.  5. Each operation shall be evaluated at least once every 6 mos or as otherwise indicated by a PIH.  6. If an employee is found to be exposed in excess of the TWA, controls shall be initiated and the exposure of the employee evaluated	Protective clothing  1. Shall be resistant to the penetration and chemical action of furfuryl alcohol.  2. Additional protection, including gloves, bib-type aprons, boots, and overshoes shall be provided for and worn by each employee while in any operation that may cause direct contact with liquid furfuryl alcohol.  3. Supplied-air hoods and suits resistant to penetration by furfuryl alcohol shall be worn when entering confined spaces, such as pits or storage tanks.  4. Where heat stress is likely to occur, supplied-air suits, preferably cooled, are recommended.  5. Protective equipment suitable for emergency use shall be located at clearly identified stations outside the work area.  6. The employer shall ensure that all personal protective clothing is inspected regularly for	1. Records of IH surveys shall be kept.  2. Environmental records shall be kept for at least 30 yrs after the last occupational exposure.  3. Shall include the dates and times of measurements; duties and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; TWA concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. Records shall be available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne furfuryl alcohol above the action level.  2. Action level = 1/2 the TWA.

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Furfuryl alcohol (continued)</b>		<p>at least once every wk. The employee shall be notified of the exposure and of the controls being implemented. This shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the PEL. Semiannual monitoring may then be resumed.</p>	<p>defects and is maintained in a clean and satisfactory condition.</p> <p><b>Eye protection</b></p> <p>7. Safety glasses with side shields, chemical safety goggles, or face shields with goggles, made completely of material resistant to furfuryl alcohol, shall be provided by the employer, and shall be worn during any operation in which furfuryl alcohol may enter the eyes.</p> <p><b>Respiratory protection</b></p> <p>8. When permissible, respirators shall be provided in accordance with Table I-1 and the employer shall ensure that the employee uses the respirator when necessary.</p> <p>9. Employees shall be trained and drilled at least annually in the proper use of respirators and in testing for leakage of respirators assigned to them. The employer shall also ensure that respirators are adequately cleaned and maintained.</p>						



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Furfuryl alcohol (continued)			10. Protective equipment for emergency entry shall be located at clearly identified places outside the work area.  <b>Hygiene practices</b> 11. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Glycidyl ethers (NIOSH 78-166, 6/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>Past exposure to glycidyl ethers or other vinyl derivatives;</li> <li>History of sensitivities, reproductive events.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Eyes;</li> <li>Mucous membranes.</li> </ol> </li> <li>Clinical tests, as DBRP:               <ol style="list-style-type: none"> <li>Total and differential leukocyte counts;</li> <li>Urinalysis;</li> <li>Pulmonary function tests;</li> <li>Manual dexterity tests;</li> <li>Visual-motor coupling tests.</li> </ol> </li> </ol>	<b>As DBRP</b> 1. Same as in A.1, 2, and 3.	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee/former employee.</li> </ol>	<ol style="list-style-type: none"> <li>In the event of an illness suspected to be due to glycidyl ethers:               <ol style="list-style-type: none"> <li>Physical exam as in A.2 and 3.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm).	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Glycidyl ethers (NIOSH 78-166, 6/78)	<p>1. Ceiling limits: allyl glycidyl ether (AGE): 45 (9.6); isopropyl glycidyl ether (IGE): 240 (50); phenyl glycidyl ether (PGE): 5 (1); n-Butyl glycidyl ether (BGE): 30 (4.4); di-2,3- epoxypropyl glycidyl ether (DGE): 1 (0.2).</p> <p>2. Procedures for the collection and analysis of workroom air samples for compliance with the standard shall be as provided in Appendices I, II, and III, or by any methods shown to be at least equivalent in precision,</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Each employer with a place of employment where glycidyl ethers are present shall conduct an IH survey to determine whether exposure to glycidyl ethers may occur.</p> <p>2. Surveys shall be repeated at least semiannually and within 30 days after any process change likely to result in increased concentrations of airborne glycidyl ethers.</p> <p><b>Personal monitoring</b></p> <p>3. If it is determined that exposure to airborne glycidyl ethers has occurred, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees who are occupationally exposed to glycidyl ethers.</p> <p>4. Monitoring of employee exposure to airborne glycidyl ethers shall be conducted at least semiannually.</p> <p>5. If monitoring reveals that an employee is exposed to glycidyl ethers at</p>	<p><b>Protective clothing</b></p> <p>1. The employer shall provide appropriate clothing, including gloves, aprons, suits, boots, and face shields (8 in minimum), made of materials impervious to glycidyl ethers, e.g., milled butyl rubber or polyvinyl alcohol, and shall ensure that such clothing is worn by every employee to prevent skin contact. The protective clothing shall also be fire-resistant. Gloves shall be of sufficient length to protect the forearms of the employees.</p> <p>2. The employer shall ensure that a change of clothing is immediately available to any employee whose clothes become grossly contami- nated with glycidyl ethers.</p> <p>3. Leather articles, such as belts or shoes, that become contaminated with glycidyl ethers shall be rendered unfit for use and discarded.</p> <p>4. The employer shall provide separate storage</p>	<p>1. IH survey records shall be maintained.</p> <p>2. Records of environmental monitoring and exposure information shall be kept by the employer for at least 30 yrs after the employee's last occu- pational exposure to glycidyl ethers.</p> <p>3. These records shall include the dates of measurements; job function and location of the employees at the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; ceiling concen- trations estimated from these samples; type of personal protective equipment in use at the time of sampling; and identification of exposed employees.</p> <p>4. Each employee shall be able to obtain information on his or her own environmental exposures.</p> <p>5. Environmental monitoring records shall be made available to DR of the Sec. of Labor, the Sec. of HHS, the employer, and the employee.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = work in any area where glycidyl ethers are manu- factured, stored, used, or handled.</p>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Glycidyl ethers (continued)	sensitivity, and accuracy to the methods specified.	concentrations in excess of the appropriate ceiling limit, controls shall be initiated, the employee notified of the exposure and of the controls being implemented to correct the situation, and the exposure of that employee monitored at least once every 30 days. Such monitoring shall continue until 2 consecutive evaluations, at least 30 days apart, indicate the employee's exposure no longer exceeds the ceiling limits. Semiannual monitoring may then be resumed.	facilities for work clothes and for street clothes and shall ensure that employees do not remove protective clothing from the workplace.  5. The employer shall inform persons involved in laundering or handling the contaminated clothing of the hazardous properties of glycidyl ethers.  6. Safety showers and eyewash fountains shall be provided in appropriate areas. This equipment shall be checked periodically to ensure that it is in proper working condition.  Eye protection  7. Chemical safety goggles (splashproof) or face shields (8 in minimum) with goggles shall be provided by the employer and shall be worn during any operation in which there is a reasonable possibility of glycidyl ethers being splashed into the eyes.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Glycidyl ethers (continued)</p>			<p><b>Respiratory protection</b></p> <p>8. When permissible, the employer shall provide respirators in accordance with Tables I-1, I-2, I-3, and I-4 and shall ensure that employees use the respirators properly when the concentrations of airborne glycidyl ethers exceed the ceiling concentrations.</p> <p>9. Protective equipment suitable for emergency entry shall be located at clearly identified areas outside the work area.</p> <p><b>Hygiene practices</b></p> <p>10. Sanitation measures specified.</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE</b> <b>(REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA</b> <b>STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hot environments (NIOSH 72-10269, 6/72)	<ol style="list-style-type: none"> <li>Medical examination, with attn to:               <ol style="list-style-type: none"> <li>Cardiovascular system;</li> <li>Renal system;</li> <li>Hepatic system;</li> <li>Endocrine system;</li> <li>Respiratory system;</li> <li>Skin.</li> </ol> </li> <li>History of previous heat-related disorders and illnesses.</li> </ol>	<b>Biennially</b> <ol style="list-style-type: none"> <li>For those <math>\leq 45</math> yrs old.</li> <li>Same as in A.</li> </ol> <b>Annually</b> <ol style="list-style-type: none"> <li>For those <math>&gt; 45</math> yrs old.</li> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for all persons assigned to hot jobs for the period of employment and for 1 yr thereafter.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hot environments (NIOSH 72-10269, 6/72)</b>	1. Hot environmental condition means any combination of air temperature, humidity, radiation, and wind speed that exceeds a wet bulb globe temperature (WBGT) of 79°F.	1. A WBGT profile shall be established for each workplace for winter and summer seasons to serve as a guide for deciding when work practices need to be initiated to control extremes of hot or cold. The first profile shall be established within 3 mos of the effective date of the standard.  2. After the WBGT profiles have been established, monitoring shall be conducted once during July and August of each yr.		1. The following records shall be maintained: a. Records of acclimatization; b. Records of the WBGT for each work area.  2. Retain (a) for the period of employment and 1 yr thereafter.  3. Retain (b) for a period determined by the Sec. of Labor with consultation with the Sec. of HHS.	Yes	Yes	Yes		

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrazines (NIOSH 78-172, 6/78)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special attn to:               <ol style="list-style-type: none"> <li>a. Dermal contact.</li> </ol> </li> <li>2. Comprehensive physical exam, with special attn to:               <ol style="list-style-type: none"> <li>a. Dermal contact.</li> </ol> </li> <li>3. Clinical tests, including:               <ol style="list-style-type: none"> <li>a. Complete and differential blood count;</li> <li>b. Liver function test (SGOT, SGPT included);</li> <li>c. Urinalysis, including specific gravity, glucose, protein, microscopic exam;</li> <li>d. 14" x 17" post/ant chest X-ray.</li> </ol> </li> <li>4. Urobilinogen and serum bilirubin tests, as DBRP.</li> <li>5. Ability to use positive pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, 3, and 4.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after last occupational exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. For those with illness due to exposure:               <ol style="list-style-type: none"> <li>a. Appropriate medical services.</li> </ol> </li> </ol> <b>In an emergency</b> <ol style="list-style-type: none"> <li>2. Immediate medical attention and appropriate follow-up medical care.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES



# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELLING POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrazines</b> <b>(NIOSH 78-172, 6/78)</b>	1. Ceiling limits for 2-hr period: hydrazine (H): 0.04 (0.03); monomethyl hydrazine (MMH): 0.08 (0.04); unsymmetrical dimethyl hydrazine (UDMH): 0.15 (0.06); phenyl-hydrazine: 0.6 (0.14).  2. Samples in the work environment shall be collected and analyzed according to the procedures described in Appendix I, or by any methods at least equivalent in precision, accuracy, and sensitivity.	<b>Industrial hygiene survey</b>  1. Each employer who has a place of employment in which any of the hydrazines are stored, produced, processed, or otherwise used shall determine by an IH survey the areas in which occupational exposure occurs.  2. Surveys shall be repeated at least annually and within 14 days after any process change likely to result in occupational exposure to hydrazines.  <b>Personal monitoring</b>  3. If it has been determined that occupational exposure to hydrazines (other than 1,2-dimethylhydrazine) occurs, the employer shall institute a program of personal monitoring to identify and measure the exposure of each employee.  4. Source and area monitoring may be used to supplement personal monitoring.  5. Each operation in each regulated area shall be sampled at least once every 6 mos while hydrazines are	<b>Protective clothing</b>  1. The employer shall provide full-body protective clothing, including gloves and boots, and shall ensure that employees wear this clothing when spills or splashes of hydrazines may occur, such as during repair or during transfer operations.  2. Gross contamination shall be removed from protective clothing before the clothing is taken off the wearer.  3. Emergency equipment shall be located at well-marked and clearly identified stations and shall be adequate to permit all personnel to escape from the area.  <b>Eye protection</b>  4. The employer shall provide full-face shields (8 in minimum) and goggles which shall be worn during any operation in which there is a reasonable possibility that hydrazines may enter the eyes or splash onto the face.	1. IH survey records shall be maintained until the next survey is completed.  2. Records of environmental monitoring and pertinent medical records shall be kept for at least 30 yrs after the employee's last occupational exposure to hydrazines.  3. Records of environmental monitoring shall include an identification of the employee being monitored; duties and job locations within the worksite; time and dates of sampling and analysis; sampling and analytical methods used and available evidence of their precision and accuracy; the number, duration, and results of samples taken; environmental concentrations determined from these samples; and the type of personal protective equipment used by the employee.  4. Rosters of authorized persons who enter regulated areas shall also be retained for 30 yrs.  5. Environmental monitoring records and entry rosters	Yes	Yes	Yes	1. Occupational exposure = work in any area where one or more of the hydrazines is stored, produced, processed, transported, handled, or otherwise used and present in such a manner that vapors or aerosols may be released in workroom air or that the materials may spill or splash onto the skin or into the eyes.

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Hydrazines (continued)		being used. For inter- mittent operations, i.e., lasting for less than 6 mos, at least 1 monitoring regimen shall be conducted during each operation period.  6. If an employee is found to be exposed to the hydrazines at concen- trations exceeding the recommended ceiling limits, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended occu- pational exposure limit; routine semiannual monitoring may then be resumed.	<b>Respiratory protection</b> 5. Respirators may be used only when engineering controls are being installed or tested, during non- routine maintenance or repair, in emergencies that may involve brief exposure in excess of the recommended limits, or for entry into confined spaces. In the situations listed above, employees exposed to 1,2-dimethylhydrazine shall wear a respirator. 6. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that, when required, they are properly used. 7. The employer shall ensure that employees are properly instructed in the use of respirators assigned to them and how to test for leakage, proper operation, and proper fit as judged by quantitative fit tests. 8. Protective equipment suitable for emergency entry or reentry shall be located at clearly identified stations outside the work area. <b>Hygiene practices</b> 9. Sanitation measures specified.	shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.  6. Each employee shall be able to obtain information on his or her own environmental exposures.					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrogen cyanide and cyanide salts (NIOSH 77-108, 10/76)	<ol style="list-style-type: none"> <li>1. Work and medical histories, with attn to:               <ol style="list-style-type: none"> <li>a. Skin disorders;</li> <li>b. Nonspecific symptoms such as headache, nausea, vomiting, dizziness, weakness.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Thyroid;</li> <li>c. Cardiovascular system;</li> <li>d. Upper respiratory system.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<b>Annually</b> 1. Same as in A.1.	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after last occupational exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>In an emergency</b> 1. First aid.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Hydrogen cyanide and cyanide salts (NIOSH 77-108, 10/76)	<p>1. Ceiling limit for 10 min: HCN: 5 (4.7); cyanide salts: 5 (4.7). Not to be exceeded, combined or separate.</p> <p>2. Procedures for sampling, calibration of equipment, and analysis of air samples for HCN and cyanide salts shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to those specified.</p> <p>3. A sampling period of about 10 min is necessary to provide an amount of cyanide readily amenable to analysis by the cyanide selective electrode.</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Workers will not be considered to have occupational exposure to HCN or cyanide salts if environmental concentrations, determined on the basis of an IH survey conducted within 6 mos of the promulgation of standards, do not exceed 1/2 of the recommended ceiling values.</p> <p>2. Surveys shall be repeated at least once every 3 yrs and within 30 days after any process change likely to result in increases of airborne concentrations of HCN or cyanide salts.</p> <p><b>Personal monitoring</b></p> <p>3. If the survey indicates that airborne concentrations of HCN or cyanide salts may exceed the respective occupational exposure levels, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees who are occupationally exposed to HCN and/or cyanide salts.</p>	<p><b>Protective clothing</b></p> <p>1. Because HCN and cyanide salts, dry or in solution, may be absorbed readily through the skin or any break in the skin, the provision and use of protective clothing are necessary for the protection of workers in most operations where HCN and cyanide salts are used in pure or diluted condition.</p> <p>2. When entering a HCN gas-filled area in emergency situations, when the airborne concentration of HCN is unknown, or when the known airborne concentration is greater than 200 ppm, employees shall wear gas-tight suits in addition to the required respiratory protection. The gas-tight suits shall provide full-body protection.</p> <p>3. Employees engaged in maintenance, repair, or other work on equipment, or in circumstances whereby they may be exposed to</p>	<p>1. IH survey records shall be maintained until a new survey is conducted.</p> <p>2. Records shall be maintained and shall include sampling and analytical methods, types of respiratory protective devices used, and ceiling concentrations found.</p> <p>3. Each employee shall be able to obtain information on his or her own environmental exposures.</p> <p>4. Records of occupational accidents and exposures shall be maintained for 5 yrs after the worker's last occupational exposure to cyanide.</p> <p>5. Shall be available to DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = exposure to concentrations of HCN or cyanide salts in excess of the action level.</p> <p>2. Action level = 1/2 the ceiling limit.</p> <p>3. Gas or liquid HCN shall be handled in closed systems as far as practicable.</p> <p>4. Inhalation of cyanides or their absorption through the skin may be immediately dangerous to life.</p>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Hydrogen cyanide and cyanide salts (continued)		<p>4. Interim monitoring of employee exposure shall be conducted at least every 6 mos.</p> <p>5. If monitoring of an employee's breathing zone reveals that the employee is exposed to concentrations of cyanide in excess of the recommended ceiling value, the exposure of that employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of his or her exposure and of the control measures being implemented to correct the situation. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the ceiling values. Semiannual monitoring may then be resumed.</p> <p><b>Area monitoring</b></p> <p>6. In workplaces where there is the potential for release of HCN in sufficient quantities to be lethal in a short time, airborne HCN concentrations shall be</p>	<p>HCN liquid or gas, shall wear protective garments or suits made of material impervious to HCN and providing full-body protection.</p> <p>4. Employees shall wear rubber gloves when engaged in any activity which may involve the handling of, or possible contact with, HCN.</p> <p>5. Employees shall wear footwear impervious to HCN when working in areas or engaged in activities where spillage of liquid cyanide is likely. Such footwear or overshoes should be worn by workers handling cylinders of HCN or cans of absorbed HCN.</p> <p>6. Employees working in tanks or other confined spaces shall wear approved harness and lifelines. All standard safety precautions for work in such spaces shall be observed with special vigilance because of the great toxicity of HCN. In all such cases, at least one other employee shall be in attendance and in</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Hydrogen cyanide and cyanide salts (continued)		monitored continuously. Monitoring procedures to be followed should be in keeping with the guidelines in Appendix III.	contact (preferably in sight contact) and in a safe area or at a distance where he will not be affected by emergencies involving the first employee. The second employee (buddy) should be alert and equipped to summon help to render aid if needed.  7. Employees shall wear gloves when handling dry cyanide salts and when using or handling equip- ment whose surfaces may be contaminated with these salts in such a manner that contact of the chemical with the employee's hands is possible or likely.  8. Employees shall wear gloves made of rubber or other impervious material when engaged in any operation wherein contact of the hands with solutions of cyanide salts is possible or likely.  9. Employees shall wear protective sleeves, aprons, and/or full-body protective clothing as needed to protect their skin from contact with					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen cyanide and cyanide salts (continued)</b>			<p>cyanide salts, dry or in solution. When handling solutions, the outer garment shall be of rubber or other material impervious to the solutions involved in the exposures. The garments shall fit snugly about the wrist, arm, neck, waist, and/or ankle (as appropriate to the particular garment) and shall have closures which will exclude dust, powder, mist, and/or splashes of cyanide salts in either dry or liquid formulations.</p> <p>10. In areas where spills or splashes of solutions of cyanide salts are likely to occur, the employees shall wear shoes, boots, or overshoes made of rubber or other material impervious to these solutions.</p> <p>11. The employer shall be responsible for maintaining all devices and clothing to be used for personal protection in a clean and effective condition.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen cyanide and cyanide salts (continued)</b>			<b>Eye protection</b>  12. Eye protection shall be provided by the wearing of a full-facepiece respiratory protective device whenever there exists a hazard of contact of the eyes or conjunctivae with HCN in liquid form. Any circumstances having the potential for injury of the eye by exposure to HCN liquid or gas almost certainly will also present a potential for hazard by inhalation which requires the wearing of respiratory protection. In case of doubt, the respiratory protective device should be worn.  13. Chemical safety goggles shall be worn by employees engaged in any operation wherein there is danger or likelihood that dusts or solutions of cyanide salts will come into contact with the eye.  14. Full-length face shields with forehead protection shall be worn by employees engaged in						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen cyanide and cyanide salts (continued)</b>			<p>any operation wherein there is danger or likelihood that dusts, molten salts, or solutions of cyanide salts may contact the face.</p> <p><b>Respiratory protection</b></p> <p>15. When permissible, the employer shall provide respirators in accordance with Tables I-1 and I-2 and shall ensure that the employee uses the respirator provided.</p> <p>16. Cartridges or canisters shall be discarded and replaced with fresh canisters after each use. Unused canisters shall be discarded and replaced when seals are broken, after 3 yrs if seals are unbroken, or on the manufacturer's recommendation, whichever is first. Cartridges and canisters shall not be used for periods of time in excess of those indicated in Tables I-1 and I-2.</p> <p>17. Emergency and escape-type respirators shall be made immediately available at the work</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Hydrogen cyanide and cyanide salts (continued)			<p>stations for each worker when there is potential for exposure to concentrations of the various cyanides above the ceiling values. For purposes of selection of respiratory protective equipment, entry into areas containing unknown and/or suspected dangerous atmospheric concentrations of HCN or cyanide salts shall be treated as an emergency.</p> <p><b>Hygiene practices</b></p> <p>18. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrogen fluoride (NIOSH 76-143, 3/76)	<ol style="list-style-type: none"> <li>1. Work and medical histories:               <ol style="list-style-type: none"> <li>a. Exposure to hydrogen fluoride, inorganic fluoride;</li> <li>b. Respiratory diseases;</li> <li>c. Renal diseases.</li> </ol> </li> <li>2. Physical exam:               <ol style="list-style-type: none"> <li>a. Urinalysis:                   <ol style="list-style-type: none"> <li>i. Pre-exposed fluoride concentration in urine;</li> <li>ii. Renal function;</li> </ol> </li> <li>b. Skin and corneas for presence of scars;</li> <li>c. X-ray of pelvis of all male workers, with shielding of gonads;</li> <li>d. Renal diseases;</li> <li>e. Pulmonary function;</li> <li>f. Osteofluorosis.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<p><b>Not specified</b></p> <ol style="list-style-type: none"> <li>1. X-ray of male pelvis, as DBRP (or when average of preshift urinary fluoride concentration for preceding 6 yrs exceeds 4.0 mg F/l).</li> <li>2. Same as in A.3.a and b.</li> </ol> <p><b>Biological monitoring</b></p> <ol style="list-style-type: none"> <li>3. Postshift F urinalysis shall be made available at intervals not exceeding 3 mos to at least ¼ of all workers with occupational exposure to HF.</li> <li>4. Each exposed worker shall have the opportunity of receiving an F analysis of his urine every yr.</li> <li>5. Spot urine samples shall be collected at the conclusion of the work shift after 4 or more consecutive days of exposure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain all medical records, including all information regarding biologic determinations, at least 20 yrs after termination of employment for all workers subject to occupational exposure.</li> <li>2. Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. As DBRP, if signs/symptoms of respiratory tract irritation present when examined by physician:               <ol style="list-style-type: none"> <li>a. Follow-up chest X-ray;</li> <li>b. Pulmonary function tests.</li> </ol> </li> <li>2. For eye complaints following exposure:               <ol style="list-style-type: none"> <li>a. Follow-up visual acuity tests;</li> <li>b. Ophthalmologic exam, as necessary.</li> </ol> </li> <li>3. For skin contact, prompt medical attention.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Hydrogen fluoride (NIOSH 78-143, 3/76)	1. TWA: 2.5.  2. Ceiling limit for 15 min: 5.0.  3. Procedures for sampling air for HF, calibration of equipment, and analysis of samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.	1. Each employer who has a place of employment in which hydrogen fluoride may be released into the workplace air shall determine if any employee is occupationally exposed to hydrogen fluoride.  2. This determination shall be made within 30 days after first operation of a production, process, or control change resulting in possible increase in the quantity of hydrogen fluoride released, or when the employer has any reason to suspect that an employee may be occupationally exposed.  3. An employee shall be designated as occupationally exposed if observations and calculations made by the employer reveal that a potential exposure exists; or if any information, such as measurements of airborne concentrations of HF or the development of HF-related clinical signs or symptoms, indicate the possibility of occu-	<b>Protective clothing</b>  1. Protective clothing impervious to hydrogen fluoride shall be worn when airborne concentrations of hydrogen fluoride may exceed the environmental limits, or when direct contact with HF or HF acid may occur, e.g., when closed systems are opened for maintenance, or if leaks are likely to occur.  2. Personnel performing operations where escape of liquid or gaseous anhydrous fluoride may occur, or performing emergency operations involving exposure to liquid or gaseous anhydrous hydrogen fluoride or exposure to sprays of aqueous hydrofluoric acid shall wear impervious gloves, boots, and a continuous-flow, air-supplied impervious full-body suit with auxiliary self-contained air supply, or an impervious full-body suit and self-contained positive pressure full-facepiece breathing	1. Employers shall maintain records of accidental hydrogen fluoride release requiring evacuation and results of all exposure measurements, environmental surveys, medical examinations, and biologic monitoring.  2. Records shall be maintained so that exposure information is available for individual employees and shall indicate the type of personal protective devices, if any, in use at the time of sampling.  3. Each employee shall be able to obtain information on his or her own environmental exposures.  4. Such records shall be maintained for at least 20 yrs after the individual's employment is terminated.	Yes	Yes	Yes	1. Occupational exposure = exposure to HF at airborne concentrations at or above 1/2 the PEL.  2. Control of occupational exposure to any particulate inorganic fluorides produced as a byproduct or an endproduct of the use or production of HF shall be governed by the criteria document, "Occupational Exposure to Inorganic Fluorides."	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS). UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrogen fluoride (continued)		6. Urinary preshift F analysis shall be made available to all exposed workers at least annually.  7. Preshift spot samples shall be collected at the start of the work shift at least 48 hrs after the last occupa- tional exposure. Results shall be calculated to a specific gravity of 1.024. Urine specimens with a specific gravity less than 1.010 shall be discarded and other specimens obtained.  8. If an individual's post- shift urinary F level exceeds 7.0 mg/l, preshift spot urine samples for analysis shall be collected with- in 2 wks at the start of a work shift at least 48 hrs after a previous occupational exposure and a repeat postshift spot sample for analysis		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELLING POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen fluoride (continued)</b>		<p>pational exposure; or if the employer has been advised in writing by OSHA or NIOSH that employees have been occupationally exposed.</p> <p>4. If an employee is designated as being occupationally exposed, the employer shall design and implement a monitoring program which shall measure the airborne HF concentration to which the employee is exposed.</p> <p>5. An employee's TWA exposure shall be obtained from the results of a single 8-hr sample of airborne HF, or a series of short-period samples which represent the worker's average exposure over an 8-hr work shift. At the same time that a TWA exposure is determined, the employee's peak exposure will be obtained from the results of 15-min samples taken during periods of expected highest exposure in order to</p>	<p>apparatus. If unventilated suits are worn, stay time in the work area shall be limited with due consideration of the heat stress factors involved. An adequate supply of such protective clothing shall be kept available for emergencies.</p> <p>3. Sleeves of protective clothing shall be tight at the wrists and worn over gloves or gauntlets. Trouser legs shall be worn over boot tops.</p> <p>4. Protective clothing specifically used for hydrogen fluoride protection shall be marked distinctively, preferably with a distinctive color, to differentiate it from other protective clothing.</p> <p>5. The employer shall designate a person to be in charge of posted hydrogen fluoride hazard areas. This person shall specify, in accordance with the provisions of this standard, the protective clothing required in his area of responsibility.</p>					



## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrogen fluoride (continued)		shall be collected at the conclusion of the work shift. This shall be done at the end of the work- week in which the preshift sample is collected. If the F level of the second sample is above either the preshift limit of 4.0 mg/l or the postshift limit of 7.0 mg/l, steps shall be taken to evaluate dietary sources, personal hygiene, basic work practices, and environmental controls.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Hydrogen fluoride (continued)</p>		<p>ascertain whether the ceiling limit has been exceeded.</p> <p>6. In all monitoring, samples representative of the exposure in the breathing zone of the employee shall be collected. Where more than one occupationally exposed employee works at a specific process or operation location, an adequate number of samples shall be collected to permit construction of a TWA exposure and peak exposure for the operation or process. Variations in work and production schedules shall be considered when samples are collected.</p> <p>7. The minimum number of representative TWA exposure determinations for an operation or process shall be based on the number of workers exposed as provided in the table below, or as otherwise indicated by a PIH.</p>	<p>6. Hydrogen fluoride protective clothing shall be basified with sodium hydrogen carbonate, washed, dried, and inspected for integrity after each use, and immediately prior to reissue. Gloves shall be inspected for pinholes.</p> <p>7. A written procedure shall be established and enforced for the sequential removal of protective clothing in such a manner as to prevent skin contact with hydrogen fluoride. A recommended procedure is:</p> <ul style="list-style-type: none"> <li>a. Wash gloves, aprons, boots, or jackets and trousers (outer garments) with water;</li> <li>b. Remove mask, hood, or face shield while gloves are still on, wash with water;</li> <li>c. Remove aprons, jackets, trousers, boots, gloves—in that order;</li> <li>d. Wash hands with water, remove goggles, and wash.</li> </ul>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION							
Hydrogen fluoride (continued)		<table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table> <p>8. If an employee monitoring program measurement reveals that an employee is occupationally exposed, but not exposed in excess of the recommended environmental limit, the exposure of that employee shall be measured at least once every 6 mos.</p> <p>9. If an employee monitoring program measurement reveals that an employee is exposed in excess of the recommended environmental limit, the employee shall be notified, control measures shall be initiated, and monitoring shall continue until the adequacy of the control measures has been demonstrated.</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>8. Where complete protective clothing is required, a change house, with separate entrances for clean and contaminated personnel, shall be provided. Lockers shall be provided for street clothing. The requirements of 29 CFR 1910.141 shall be met.</p> <p>9. The employer shall supply all required protective clothing and shall be responsible for maintaining it in a clean, sanitary, and functional condition.</p> <p><b>Eye protection</b></p> <p>10. Unless eye protection is afforded by a respiratory hood or facepiece, chemical goggles and face shields shall be worn.</p> <p><b>Respiratory protection</b></p> <p>11. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>12. Each area required to be posted shall have at least 2 emergency respirators</p>				
Number of Employees Exposed	Number of TWA Determinations														
1-20	50% of the number of workers														
21-100	10 plus 25% of the excess over 20 workers														
> 100	30 plus 5% of the excess over 100 workers														

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen fluoride (continued)</b>		<p>10. If an employee monitoring program measurement reveals that an employee is not occupationally exposed, and if the next consecutive employee monitoring program measurement made not less than 5 working days later supports this finding, the employee monitoring program may be terminated for that employee.</p> <p>11. Monitoring shall also be performed when biologic monitoring of an occupationally exposed individual reveals urinary fluoride excretion above the postshift standard of 7.0 mg/liter, adjusted for specific gravity, or when the average postshift urinary fluoride excretion of an exposed group (job classification) exceeds 7.0 mg fluoride/liter, adjusted for a specific gravity of 1.024.</p> <p>12. Monitoring of the work environment in response to a high postshift urinalysis should be conducted on the same</p>	<p>and 2 sets of protective clothing readily available in nearby locations which do not require entry into a contaminated atmosphere for access. Each set shall consist of at least 2 self-contained breathing apparatus, full-facepiece pressure-demand type, and emergency protective clothing.</p> <p>13. The employer shall ensure that respirators are cleaned, maintained, and stored in accordance with 29 CFR 1910.134, as currently amended.</p> <p>14. Canisters shall be discarded after use or whenever an odor or taste is detected, and replaced with fresh canisters. Unused canisters shall be discarded and replaced when the seal is broken or at the expiration of the shelf life as recommended by the manufacturer.</p> <p><b>Hygiene practices</b></p> <p>15. Sanitation measures specified.</p>						

# **MEDICAL SURVEILLANCE**

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING</p>	<p>POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Hydrogen fluoride (continued)</p>		<p>day as the required repeat postshift urinalysis and 2-4 hrs prior to the repeat analysis to enable correlation of the air- borne concentration of HF with the urinary fluoride concentration.</p>							



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydrogen sulfide (NIOSH 77-158, 5/77)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Nervous system;</li> <li>Respiratory system.</li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Nervous system;</li> <li>Respiratory system.</li> </ol> </li> <li>Ability to use positive and negative pressure respirators, as DBRP.</li> </ol>	<b>Every 3 yrs for those exposed to HS above ceiling limit</b> 1. Same as in A.1 and 2.	<ol style="list-style-type: none"> <li>Retain for all employees who are involved in the manufacturing, processing, or handling of HS, or in any other way exposed to it, for at least 30 yrs after termination of employment.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>In the event of illness known or suspected to be caused by exposure:               <ol style="list-style-type: none"> <li>Physical exam as in A.2.</li> </ol> </li> <li><b>In an emergency</b></li> <li>First aid, with artificial respiration, if necessary.</li> <li>Prompt transport to hospital, if unconscious.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Hydrogen sulfide (NIOSH 77-158, 5/77)	<div>1. Ceiling limit for 10 min: 15 (~10).</div> <div>2. Evacuation of the area shall be required if the HS concentration exceeds 70 mg/m<sup>3</sup>.</div> <div>3. Procedures for sampling and analysis of workplace air for the ceiling limit shall be as provided in Appendices I and II, or by any other method shown to be at least equivalent in precision, accuracy, and sensitivity to the methods specified.</div> <div>4. Monitoring for the evacuation limit shall be as provided in Appendix III, or by any method shown to be at least equivalent in</div>	<div>Industrial hygiene survey</div> <div>1. Employers shall determine by an IH survey at each location where hydrogen sulfide may be released into workplace air where exposure to hydrogen sulfide at concentrations above the recommended occupational exposure limits may occur.</div> <div>2. Surveys shall be repeated at least once every 3 yrs and immediately after any process change likely to result in increased concentrations of air-borne hydrogen sulfide.</div> <div>Personal monitoring</div> <div>3. If it has been determined that there is occupational exposure to HS, the employer shall institute a program of personal monitoring to determine the ceiling exposures of each employee occupationally exposed to HS.</div> <div>4. Source and area monitoring may be used to supplement personal monitoring.</div>	<div>Respiratory protection</div> <div>1. When use of a respirator is permitted, it shall be selected in accordance with the specifications in Table I-1 and employers shall ensure that employees use the respiratory protective equipment when necessary.</div> <div>2. Employers shall ensure that respirators are properly cleaned and maintained and that employees are trained and drilled in the location and use of respirators assigned to them and in testing donned respirators for leaks.</div> <div>3. Respirators shall be easily accessible and employees shall be informed of their location and recognition if respirators for more than one purpose are present.</div> <div>4. Training in respiratory protection shall include actually wearing and using the equipment. Training in respiratory equipment shall be started before a worker goes on the job and shall be repeated at least quarterly and each time a</div>	<div>1. Employers shall keep records of IH surveys.</div> <div>2. Employers or their successors shall keep records of environmental monitoring for each employee for at least 30 yrs after the individual's employment has ended.</div> <div>3. These records shall include dates of measurements; job function and locations of the employees at the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; ceiling concentrations estimated from these samples; type of personal protective equipment used; and the exposed employees' names.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div> <div>5. Environmental records shall be made available to DR of the Assistant Sec. of Labor for OSHA and of the Director of NIOSH.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = any work-place situation in which HS is stored, used, produced, or may be evolved as a consequence of the process.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Hydrogen sulfide (continued)	accuracy, reliability, sensitivity, and speed to that specified.	<p>5. Such monitoring shall be done quarterly or as recommended by a PIH.</p> <p>6. Recording automatic monitors shall be permitted to show short-term (less than 1 min) peaks of up to 70 mg/cu m (50 ppm), as long as no more than one such peak appears in any 30-min period.</p> <p>7. If an employee is found to be exposed to hydrogen sulfide above the recommended ceiling concentration limit, the exposure of that employee shall be monitored at least once a wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Weekly monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environ-</p>	<p>new crew is formed. All members of a crew should receive the same training, even if some have had a previous training session in the same quarter. Workers actually or potentially exposed frequently to hydrogen sulfide shall receive training in respiratory protection before starting work.</p> <p>5. Full-facepiece respiratory protection also protects the eyes.</p> <p>6. Emergency equipment shall be located at clearly identified stations within the work area and shall be adequate to permit all employees to escape safely from the area. Protective equipment suitable for emergency use shall be located at clearly identified stations outside the exposure area.</p> <p>Hygiene practices</p> <p>7. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen sulfide (continued)</b>		<p>mental limit; then, quarterly or less frequent monitoring may be resumed.</p> <p><b>Alarm/evacuation monitoring for peak concentrations</b></p> <p>8. A program of continuous monitoring shall be instituted to signal a spark-proof audible or visual alarm, as appropriate, if and when the concentration of hydrogen sulfide in the workplace air equals or exceeds 70 mg/cu m (50 ppm). Requirements for such a system are given in Appendix III.</p> <p>9. When an alarm signals that hydrogen sulfide is present at concentrations of 50 ppm or greater, the workers in the contaminated area shall be evacuated immediately to safe areas. Workers using appropriate respiratory protection may reenter the contaminated area for rescue, repair, or contingency activity.</p> <p>10. Fixed monitors shall also have a different alarm to signal the presence of</p>							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydrogen sulfide (continued)</b>		<p>hydrogen sulfide at concentrations of 15-70 mg/cu m (10-50 ppm). This alarm is for alert only and shall not require evacuation. The worker shall be trained to recognize and distinguish between the alarms.</p> <p>11. Continuous direct-reading hydrogen sulfide monitors shall be used in fixed locations near the ground or near operations where hydrogen sulfide may be released. This may be done only if air currents will not move air from areas where hydrogen sulfide is released away from the detector.</p> <p>12. Portable monitors shall be used in areas where fixed monitors are not appropriate or to supplement fixed monitoring, for example, where there are air currents.</p> <p>13. NIOSH-approved detector tubes for hydrogen sulfide shall be an acceptable</p>							



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b> / <b>P O S T I N G</b>	<b>P R A C T I C E S</b> <b>W O R K</b>	<b>ADDITIONAL INFORMATION</b>
Hydrogen sulfide (continued)		substitute for continuous monitoring when there are no air currents, as in some confined spaces.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Hydroquinone (NIOSH 78-155, 4/78)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>a. Eye injury;</li> <li>b. Dermatitis;</li> <li>c. Gastrointestinal disturbances.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Eyes;</li> <li>b. Skin.</li> </ol> </li> <li>3. Slit-lamp exam of eyes.</li> <li>4. Ability to use positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Interim work and medical histories.</li> <li>2. Ophthalmic exam by trained individual with slit-lamp (biomicroscope) or better technique. If damage to the cornea is found, eyes should be examined by an ophthalmologist.</li> <li>3. Physical exam as in A.2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for 30 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>In an emergency</b> <ol style="list-style-type: none"> <li>1. First aid and observation for delayed eye effects.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Hydroquinone (NIOSH 78-155, 4/78)	<ol style="list-style-type: none"> <li>1. Ceiling concentration for 15 min: 2.0 (~0.44).</li> <li>2. Environmental samples shall be collected and analyzed as described in Appendix I, or by any method shown to be at least equivalent in accuracy, precision, and sensitivity to the methods specified.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Each employer with a place of employment in which hydroquinone is present shall determine by an IH survey whether occupational exposure to airborne hydroquinone is occurring at concentrations above the ceiling value.</li> <li>2. Surveys shall be repeated annually and quarterly, where necessary, and not more than 10 days after any process change likely to increase airborne hydroquinone concentrations.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If the hydroquinone environmental concentrations exceed or seem likely to exceed the ceiling value, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to airborne hydroquinone.</li> <li>4. Each work area shall be sampled quarterly or as indicated by a PIH.</li> <li>5. If an employee is found to be exposed to a</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Appropriate protective clothing, including gloves, long-sleeved coveralls, rubber footwear, face shields (8 in minimum), and goggles, shall be worn where needed to limit eye and skin contact with hydroquinone. Water-resistant clothing is advisable in operations involving solutions of hydroquinone.</li> </ol> <p><b>Eye protection</b></p> <ol style="list-style-type: none"> <li>2. Appropriate eye protection (face shields with or without safety goggles) shall be worn in any operation in which hydroquinone (solid, liquid, or spray) may contact the eyes.</li> <li>3. Where aerosolization of concentrated solutions of hydroquinone is likely, face shields shall be supplemented with safety goggles.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. When a respirator is permitted, the employer shall provide respirators in accordance with Table I-1 and shall ensure that</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained.</li> <li>2. Records of environmental monitoring shall be maintained for at least 30 yrs after termination of employment.</li> <li>3. These records shall include the dates of measurements; job function and location of the employees at the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; concentrations estimated from these samples; type of personal protective equipment used; and exposed employees' names.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>5. Environmental records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = work in any area where hydroquinone is stored, produced, processed, or otherwise used, except as a component of other materials at a concentration of 5% or less by weight.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Hydroquinone (continued)</b>		concentration of hydroquinone above the recommended ceiling value, the exposure of that employee shall be measured at least once a wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Weekly monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental limit; routine monitoring may then be resumed.	the employee uses the respirator provided when necessary.  5. Respirators shall be easily accessible and employees shall be informed of their location.  <b>Hygiene practices</b>  6. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Isopropyl alcohol (NIOSH 76-142, 3/76)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Sinuses;</li> <li>c. Respiratory system.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> <li>4. As DBRP:               <ol style="list-style-type: none"> <li>a. X-rays;</li> <li>b. Laryngoscopy;</li> <li>c. Bronchoscopy.</li> </ol> </li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for all persons with occupational exposure, for maintenance personnel with occasional occupational exposure, and for all employees engaged in manufacturing.</li> <li>2. Retain at least 5 yrs after termination of employment, except for those employed in manufacturing areas, in which records shall be retained at least 30 yrs.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>1. Appropriate health care.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Isopropyl alcohol (NIOSH 76-142, 3/76)	<ol style="list-style-type: none"><li>1. TWA: ~984 (400).</li><li>2. Ceiling limit for 15 min: ~1,968 (800).</li><li>3. Procedures for collection of workplace environmental samples shall be as provided in Appendix I, or by any method shown to be equivalent in precision, accuracy, and sensitivity. Analysis of samples shall be as provided in Appendix II, or by any method shown to be equivalent in precision, sensitivity, and accuracy.</li></ol>	<ol style="list-style-type: none"><li>1. Work areas where it has been determined on the basis of an IH survey that environmental levels do not exceed 1/2 the TWA environmental limits are not considered to have occupational exposure to isopropyl alcohol.</li><li>2. Surveys shall be repeated when a process change indicates to a qualified person in authority the need for reevaluation.</li><li>3. Where there is occupational exposure to isopropyl alcohol, an adequate number of breathing zone samples shall be collected and analyzed to characterize the TWA and ceiling concentrations of each operation and work location in which there is occupational exposure to isopropyl alcohol.</li><li>4. This sampling and analysis shall be repeated every 6 mos except as otherwise indicated by a PIH.</li><li>5. Additional sampling and analysis shall be performed whenever changes in process, worksite, climate, or engineering controls are</li></ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"><li>1. A clean change of clothing shall be made available promptly to each employee whose clothes become wetted with isopropyl alcohol spills, and to each employee whose clothes become wetted with spills of any material in isopropyl alcohol-manufacturing areas.</li><li>2. If it is necessary for employees to withdraw samples from the isopropyl alcohol-manufacturing process, employees shall be required to wear appropriate protective clothing including impervious suits, gloves, boots, and air-supplied hoods.</li></ol> <p><b>Eye protection</b></p> <ol style="list-style-type: none"><li>3. Eye protective devices, such as safety goggles or safety glasses, shall be provided for any employee working in an operation that might result in isopropyl alcohol splashing into the eyes.</li></ol>	<ol style="list-style-type: none"><li>1. IH survey records shall be maintained until a new survey is completed.</li><li>2. Records shall be maintained and shall include sampling and analytical methods, types of respiratory protective devices used, and TWA and ceiling concentrations found.</li><li>3. Each employee shall be able to obtain information on his or her own environmental exposures.</li><li>4. Records of occupational accidents and environ- mental exposures within the workplace shall be maintained for at least 30 yrs after the worker's employment in isopropyl alcohol-manufacturing areas has ended.</li><li>5. For all other areas of isopropyl alcohol exposure, pertinent records shall be maintained for at least 5 yrs after the worker's employment has ended.</li><li>6. These records shall be available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</li></ol>	Yes	Yes	Yes	<ol style="list-style-type: none"><li>1. Occupational exposure = exposure at or above the action level.</li><li>2. Action level = 1/2 the TWA.</li></ol>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Isopropyl alcohol (continued)		<p>likely to cause an increase in airborne concentrations.</p> <p>6. If initial, periodic, or special evaluations indicate that TWA or ceiling concentration limits are exceeded, corrective engineering or other control measures shall be promptly instituted to ensure the safety of employees, until concentrations below these environmental limits are achieved. In such cases, sampling of each operation and work location shall be conducted at least monthly until 2 consecutive 30-day sampling periods have shown that concentrations of isopropyl alcohol are at or below the workplace environmental limits.</p>	<p><b>Respiratory protection</b></p> <p>4. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>5. Where an emergency may develop which could result in employee injury from inhalation of isopropyl alcohol, the employer shall provide respiratory protection as listed in Table I-1.</p> <p><b>Hygiene practices</b></p> <p>6. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Kepone (no NIOSH number, 1/76)	<ol style="list-style-type: none"> <li>1. Comprehensive work history.</li> <li>2. Comprehensive medical history, including:               <ol style="list-style-type: none"> <li>a. Anxiety, insomnia, personality or memory disturbances;</li> <li>b. Visual disturbances;</li> <li>c. Decreased libido or unexplained infertility;</li> <li>d. Tremors;</li> <li>e. Incoordination, ataxia;</li> <li>f. Weight loss;</li> <li>g. Chest or abdominal pain;</li> <li>h. Arthralgia.</li> </ol> </li> <li>3. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Neurologic findings, such as tremor, opsoclonia (jumpy, irregular movements in all directions), short memory difficulty, exaggerated startle reflex, signs of muscular incoordination;</li> <li>b. Atrophy of the testicles;</li> <li>c. Splenomegaly;</li> <li>d. Hepatomegaly;</li> <li>e. Jaundice.</li> </ol> </li> <li>4. Ability to use negative or positive pressure respirator.</li> <li>5. Liver studies, as DBRP.</li> </ol>	<b>Annually</b> 1. Same as in A.	<ol style="list-style-type: none"> <li>1. Retain at least 30 yrs after termination of employment for all employees exposed and for maintenance personnel with periodic exposure.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
<b>Kepone</b> (no NIOSH number, 1/76)	1. TWA: 1 µg/m <sup>3</sup> .  2. Procedures for sampling and analysis of kepone in air shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.	1. Workers are not considered to have occupational exposure to kepone if, on the basis of a professional IH survey, the airborne concentration of kepone in an area where kepone is handled, processed, or stored is sufficiently low that a sampling volume equal to or greater than 1.0 cu m is necessary in order to collect 0.5 µg of kepone.  2. The minimum quantity of kepone which must be collected in order to determine with reliability the presence of kepone in a sample is 0.5 µg. In order to determine that kepone is only present in workplace air at concentrations equal to or less than 0.5 µg/cu m, it is necessary that each sample of airborne kepone that is analyzed for the purpose of making this determination be the residue from the filtration of at least 1.0 cu m of workplace air.  3. In workplaces where kepone is handled or processed, surveys shall	<b>Protective clothing</b>  1. Coveralls or other full-body protective clothing shall be worn in areas where there is occupational exposure to kepone. Protective clothing shall be changed at least daily at the end of the shift and more frequently if it should become grossly contaminated.  2. Impervious gloves, aprons, and footwear shall be worn at operations where solutions of kepone may contact the skin. Protective gloves shall be worn at operations where dry kepone or materials containing kepone are handled and may contact the skin.  3. The employer shall ensure that all personal protective devices are inspected regularly and maintained in clean and satisfactory working condition.  4. Work clothing may not be taken home by employees. The employer shall provide for	1. IH survey records shall be maintained until a new survey is conducted.  2. Records of all sampling and analysis of airborne kepone shall be maintained for at least 30 yrs after the individual's employment is terminated.  3. Records shall indicate the details of the type of personal protective devices, if any, in use at the time of sampling, and the methods of sampling and analysis used.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. If the employer who has or has had employees with occupational exposure to kepone ceases to do business without a successor, he shall forward their records by registered mail to the Director, NIOSH.  6. Daily rosters of authorized personnel entering regulated areas shall also be maintained for 30 yrs.	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne kepone at concentrations greater than 1/2 the TWA.	

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Kepona (continued)	6. Medical exam, for those with signs of skin irritation.			

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION					
<b>Kepone</b> (continued)		<p>be repeated annually and when any process change indicates a need for reevaluation.</p> <p>4. Where occupational exposure to kepone exists, samples representative of the exposure in the breathing zone of employees shall be collected by personal samplers.</p> <p>5. An adequate number of samples shall be taken in order to permit construction of TWA exposures for every operation or process. Except as otherwise determined by a PIH, the minimum number of representative TWA determinations for an operation or process shall be based on the number of workers exposed as provided in the table below.</p> <table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr></table>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	<p>maintenance and laundering of protective clothing.</p> <p>5. The employer shall ensure that precautions necessary to protect laundry personnel are taken while soiled protective clothing is being laundered.</p> <p>6. The employer shall ensure that kepone is not discharged into municipal waste treatment systems or the community air.</p> <p>7. Employers shall ensure that before employees leave a regulated area they remove and leave all protective clothing at the point of exit.</p> <p><b>Eye protection</b></p> <p>8. Eye protective devices shall be provided by the employer and used by the employees where contact of kepone with eyes is likely.</p> <p>9. Unless eye protection is afforded by a respirator hood or facepiece, protective goggles or a face shield shall be worn at operations where there is danger of contact of</p>					
Number of Employees Exposed	Number of TWA Determinations													
1-20	50% of the number of workers													
21-100	10 plus 25% of the excess over 20 workers													

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Kepone (continued)		<p>&gt; 100 30 plus 5% of the excess over 100 workers</p> <p>6. A reevaluation of the exposures of workers to airborne kepone shall be made within 30 days after installation of a new process or process changes.</p> <p>7. Samples of airborne kepone shall be collected and analyzed at least every 2 mos for those who work in areas with occupational exposure to kepone.</p> <p>8. A reevaluation of the worker's exposures to airborne kepones shall be repeated at 1-wk intervals when the airborne concentration has been found to exceed the recommended workplace environmental limit. In such cases, suitable controls shall be instituted and monitoring shall continue at 1-wk intervals until 3 consecutive surveys indicate the adequacy of controls.</p>	<p>the eyes with dry or wet materials containing kepone because of spills, splashes, or excessive dust or mists in the air.</p> <p><b>Respiratory protection</b></p> <p>10. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>11. Where an emergency may develop which could result in employee injury from kepone, the employer shall provide an escape device as listed in Table I-1.</p> <p><b>Hygiene practices</b></p> <p>12. Sanitation measures specified.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN = SOCIAL SECURITY NUMBER

DMR = DESIGNATED MEDICAL REPRESENTATIVE

HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Kepone (continued)		9. A regulated area shall be established and maintained where: a. Kepone is manufactured, reacted, mixed with other substances, re-packaged, stored, handled, or used; and b. Airborne concentrations of kepone are in excess of the workplace environmental limit. 10. Access to the regulated areas shall be limited to authorized personnel.							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ketones (NIOSH 78-173, 10/78)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories:               <ol style="list-style-type: none"> <li>Pre-existing neuropathy;</li> <li>Disorders of:                   <ol style="list-style-type: none"> <li>Nervous system;</li> <li>Respiratory system;</li> <li>Eyes.</li> </ol> </li> </ol> </li> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Central and peripheral nervous system;</li> <li>Respiratory system;</li> <li>Eyes.</li> </ol> </li> <li>Urinalysis, as indicator of kidney function.</li> <li>Appropriate liver tests, as DBRP.</li> <li>An electrodiagnostic exam (for those exposed to methyl n-butylketone), including electromyography and nerve conduction velocity measurement.</li> <li>Ability to use negative and positive pressure respirators.</li> </ol>	Annually, and as DBRP 1. Same as in A, except 6.	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after termination of employment.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If adverse health effects seen</b> 1. Appropriate medical management.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Ketones</b> <b>(NIOSH 78-173, 10/78)</b>	<p>1. TWA: acetone: 590 (250); methyl ethyl ketone: 590 (200); methyl n-propyl ketone: 530 (150); methyl n-butyl ketone: 4 (1); methyl n-amyl ketone: 465 (100); methyl iso-butyl ketone: 200 (50); methyl isoamyl ketone: 230 (50); diisobutyl ketone: 140 (25); cyclohexanone: 100 (25); mesityl oxide: 40 (10); diacetone alcohol: 240 (50); isophorone: 23 (4).</p> <p>2. Workroom air samples shall be collected and analyzed for ketones by</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Each employer with a place of employment where ketones are manufactured, processed, stored, used, handled, or otherwise present shall determine by an IH survey if there is occupational exposure to ketones.</p> <p>2. Surveys shall be repeated at least annually and within 30 days of any change likely to alter concentrations of any of these compounds in the workplace air.</p> <p><b>Personal monitoring</b></p> <p>3. If it is determined that there is occupational exposure to ketones, a program of personal monitoring shall be initiated to identify and measure the exposure of each employee occupationally exposed to airborne ketones.</p> <p>4. Source and area monitoring may be used to supplement personal monitoring.</p> <p>5. Each operation in each work area shall be evaluated at least every 30 mos if it is determined that</p>	<p><b>Protective clothing</b></p> <p>1. The employer shall provide appropriate clothing to employees who may have skin contact with liquid ketones.</p> <p>2. Protective clothing, including aprons, coats or coveralls, gloves, and boots, shall be made of material resistant to penetration by ketones.</p> <p>3. The employer shall ensure that personal protective clothing is regularly inspected for defects and that it is worn by employees when necessary to prevent skin contact with liquid ketones.</p> <p><b>Eye protection</b></p> <p>4. The employer shall provide chemical safety goggles or face shields (20 cm minimum) with goggles and ensure that they are worn by employees where eye contact with liquid ketones is likely.</p> <p><b>Respiratory protection</b></p> <p>5. When permissible, the employer shall provide</p>	<p>1. IH survey records shall be maintained.</p> <p>2. Records of workplace environmental monitoring shall be kept at least 30 yrs after the employee's last occupational exposure to ketones.</p> <p>3. These records shall include the dates and times of measurements, job function and location of the employee within the worksite, methods of sampling and analysis used, types of respiratory protection in use at the time of sampling, TWA concentrations found, and identification of the exposed employee.</p> <p>4. Each employee shall be able to obtain information on his or her own environmental exposures.</p> <p>5. Workplace environmental monitoring records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = exposure to ketones at concentrations greater than the action level.</p> <p>2. Action level = 1/2 the TWA.</p>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ketones (continued)</b>	the methods described in Appendix I, or by methods that are at least equivalent in precision, sensitivity, and accuracy.	<p>there is occupational exposure.</p> <p>6. If an employee is found to be exposed to ketones in excess of any of the TWA concentration limits, the exposure of that employee shall be measured at least once a wk, control measures shall be initiated, and the employee shall be notified of the extent of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, 1 wk apart, indicate that the employee's exposure no longer exceeds the appropriate limits. Routine monitoring may then be resumed.</p>	<p>respirators in accordance with Table I-2 and shall ensure that the employees use the respirators properly when they are required.</p> <p><b>Hygiene practices</b></p> <p>6. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Lead (inorganic)</b> (1910.1025, 4/79)	<ol style="list-style-type: none"> <li>For those who are or may be exposed above the action level for more than 30 days/yr.</li> <li>Work history, including past lead exposure at and outside work.</li> <li>Personal or medical history, with attn to: <ol style="list-style-type: none"> <li>Smoking;</li> <li>Hygiene and other habits;</li> <li>Past gastrointestinal problems;</li> <li>Past reproductive problems;</li> <li>Past cardiovascular problems;</li> <li>Past neurologic problems.</li> </ol> </li> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Teeth and gums;</li> <li>Hematologic system;</li> <li>Gastrointestinal system;</li> <li>Renal system;</li> <li>Neurologic system;</li> <li>Pulmonary status (to be evaluated if respiratory protection will be used).</li> </ol> </li> <li>Lab tests: <ol style="list-style-type: none"> <li>Blood pressure;</li> <li>Blood sample and analysis: <ol style="list-style-type: none"> <li>Blood lead levels;</li> <li>Hemoglobin;</li> <li>Hematocrit;</li> <li>Red cell indices;</li> </ol> </li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>For those in A.1 who have a blood lead level <math>\geq 40 \mu\text{g}/100 \text{ g}</math> in the past yr.</li> <li>Same as in A.</li> </ol> <p><b>Biological monitoring</b></p> <ol style="list-style-type: none"> <li>The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee who is or may be exposed above the action level for more than 30 days/yr on the following schedule: <ol style="list-style-type: none"> <li>Conduct at least every 6 mos.</li> <li>Conduct at least every 2 mos for each employee whose last blood sampling and analysis indicated a blood lead level at or above <math>40 \mu\text{g}/100 \text{ g}</math> of whole blood. This frequency</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 40 yrs, or for the duration of employment plus 20 yrs, whichever is longer.</li> <li>Include the name, SSN, a description of the duties of the employee, a copy of the physician's written opinions, results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician, and any employee medical complaints related to exposure.</li> <li>The employer shall keep, or assure that the examining physician keeps, a copy of the medical examination results including medical and work histories, a description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information, and a copy of the results of biological monitoring.</li> <li>Shall be available to the Assistant Sec. and the</li> </ol>	<ol style="list-style-type: none"> <li>For those developing signs/symptoms associated with lead intoxication: <ol style="list-style-type: none"> <li>Same as in A.</li> </ol> </li> <li>For those removed from areas due to risk of impairment of health, or for those restricted due to a final medical exam: <ol style="list-style-type: none"> <li>Appropriate medical management.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Lead (inorganic) (1910.1025)</b></p>	<p>1. TWA: 50 µg/m<sup>3</sup>.  2. If an employee is exposed to lead for more than 8 hrs in any work day, the PEL, as a TWA, shall be reduced according to the following formula: maximum permissible limit (in µg/m<sup>3</sup>) is 400 ÷ hrs worked in a day. When respirators are used to supplement engineering and work practice controls to comply with the PEL, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator</p>	<p><b>Initial determination</b>  1. The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any information, observations, or calculations which would indicate employee exposure to lead; any previous measurements of lead; and employee complaints of symptoms which may be attributable to exposure to lead.  2. Initial monitoring may be limited to a representative sample of the exposed employees believed to be exposed to the greatest concentration of lead.  3. Measurements made in the preceding 12 mos may be used to satisfy the requirement if analytical and sampling methods meet accuracy and confidence levels.  4. If the initial monitoring reveals exposure to be below the action level, the measurements need not be repeated unless a production, process,</p>	<p><b>Protective clothing and equipment</b>  1. If an employee is exposed to lead above the PEL, without regard to the use of respirators, or where the possibility of skin or eye irritation exists, coveralls or similar full-body work clothing, gloves, hats, shoes or shoe coverlets, face shields, vented goggles, or other appropriate equipment shall be provided and worn.  2. The employer shall provide protective clothing in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m<sup>3</sup> of lead as an 8-hr TWA.  3. The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness. The employer shall assure that all protective clothing is removed at</p>	<p>1. Retain all exposure records for at least 40 yrs or for the duration of employment plus 20 yrs, whichever is longer.  2. Includes the date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable; a description of the sampling and analytical methods used and evidence of their accuracy; the type of respiratory protection devices worn, if any; the name, SSN, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and the environmental variables that could affect the measurement of employee exposure.  3. Where an initial determination is made indicating no employee is exposed to airborne concentrations of lead at or above the action level, a</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>1. Action level = employee exposure to an airborne concentration of lead of 30 µg/m<sup>3</sup> as a TWA.</p>



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Lead (inorganic)</b> (continued)	<ul style="list-style-type: none"> <li>v. Peripheral smear morphology;</li> <li>vi. Zinc protoporphyrin;</li> <li>vii. Blood urea nitrogen;</li> <li>viii. Serum creatinine;</li> <li>c. Routine urinalysis, with microscopic exam;</li> <li>d. Any other tests, as DBRP.</li> </ul>	<ul style="list-style-type: none"> <li>shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/100 g of whole blood.</li> <li>6. Conduct at least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.</li> <li>7. Whenever the results of a blood lead level test indicate that an employee's blood level exceeds the numerical criterion for medical removal, the employer shall provide a second (follow-up) blood sampling test within 2 wks after the employer receives the results of the first blood sampling test.</li> <li>8. Blood lead level sampling and analysis shall have an accuracy (to a</li> </ul>	<ul style="list-style-type: none"> <li>Director for examination and copying.</li> <li>5. Provide upon request to employees and DR.</li> <li>6. Whenever an employer ceases to do business, the successor employer shall receive and retain all records. When there is no successor, records shall be transmitted to the Director.</li> <li>7. At the expiration of the retention period, the employer shall notify the Director at least 3 mos prior to the disposal and, if requested to do so, transmit all records to the Director.</li> </ul>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Lead (inorganic) (continued)</b>	<p>is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's TWA exposure.</p>	<p>control, or personnel change occurs which may result in new or additional exposure, or whenever there is reason to suspect a change which may result in new or additional exposure.</p> <p>5. If initial or subsequent monitoring reveals employee exposure to be at or above the action level but below the PEL, monitoring shall be repeated every 6 mos. This shall continue until at least 2 consecutive measurements, at least 7 days apart, are below the action level, at which time monitoring may be discontinued for the employee unless a process change occurs.</p> <p>6. If employee exposure is above the PEL, quarterly monitoring shall be conducted until 2 consecutive samplings, at least 7 days apart, are below the PEL but at or above the action level, at which time semiannual monitoring shall be resumed.</p> <p>7. The employer shall use a method of monitoring and</p>	<p>the completion of a work shift only in change rooms.</p> <p>4. The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of is placed in a closed container in the change room which prevents dispersion of lead outside the container.</p> <p>5. The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.</p> <p>6. The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.</p> <p>7. The employer shall assure that the containers of contaminated protective clothing and equipment are appropriately labeled.</p>	<p>written record should be made which includes the information specified under monitoring requirements, as well as the date of determination, location within the worksite, and the name and SSN of each employee monitored.</p> <p>4. Shall be available upon request to the Assistant Sec. of Labor, the Director of NIOSH, employees, and their DR.</p> <p>5. Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained.</p> <p>6. Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained, these records shall be transmitted to the Director.</p> <p>7. At the expiration of the retention period for the records, the employer shall notify the Director at least 3 mos prior to the disposal of such records and shall</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Lead (inorganic)</b> (continued)		confidence level of 95%) within $\pm 15\%$ or $6 \mu\text{g}/$ $100\text{ml}$ , whichever is greater, and shall be conducted by a labora- tory licensed by the Center for Disease Control, U.S. Depart- ment of HHS (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior 12 mos.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Lead (inorganic)</b> (continued)</p>		<p>analysis which has an accuracy (to a confidence level of 95%) of not less than <math>\pm 20\%</math> for airborne concentrations of lead equal to or greater than <math>30 \mu\text{g}/\text{m}^3</math>.</p> <p>8. Employees or their DR shall be given the opportunity to observe any monitoring of employee exposure to lead.</p> <p>9. Within 5 working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure. Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the PEL, the employer shall include in the written notice a statement that the PEL was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the PEL.</p>	<p><b>Respiratory protection</b></p> <p>8. Where engineering and work practice controls do not reduce employee exposure to or below the <math>50 \mu\text{g}/\text{m}^3</math> permissible exposure limit, the employer shall supplement these controls with respirators.</p> <p>9. Respirators shall be used during the time period necessary to install or implement engineering or work practice controls; where engineering and work practice controls are not sufficient to reduce exposures to or below the PEL; and whenever an employee requests a respirator.</p> <p>10. A powered, air-purifying respirator shall be provided whenever an employee chooses to use this type over the others specified in Table II, and whenever this respirator will provide adequate protection.</p> <p>11. When permissible, respirators shall be selected from Table II.</p>	<p>transmit those records to the Director if requested within the period.</p>				

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Lead (inorganic)</b> (continued)			12. Respirators shall be those approved by MSHA and NIOSH under 29 CFR Part 11.  13. Quantitative or qualitative face fit tests shall be performed at the time of initial fitting, and at least semiannually thereafter for each employee wearing negative pressure respirators. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to the worn.  14. If an employee exhibits difficulty breathing during fit testing or while using a respirator, a medical examination shall be provided to determine whether the employee can wear a respirator while performing the required duty.  15. The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN - SOCIAL SECURITY NUMBER  
DMR - DESIGNATED MEDICAL REPRESENTATIVE  
HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Lead (inorganic)</b> (continued)			16. Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.  <b>Hygiene practices</b> 17. Personal hygiene measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Logging (from felling to first haul) (NIOSH 76-188, 7/76)	<ol style="list-style-type: none"> <li>Medical exam for previously existing and new conditions that would endanger worker's safety:               <ol style="list-style-type: none"> <li>Cardiovascular system;</li> <li>Musculoskeletal system;</li> <li>Central nervous system;</li> <li>Integrity of extremities and digits;</li> <li>Integrity of hearing;</li> <li>Visual acuity;</li> <li>Peripheral vasculature (Reynaud's syndrome), for chain saw operators.</li> </ol> </li> <li>Complete series of tetanus toxoid inoculations.</li> </ol>	<ol style="list-style-type: none"> <li><b>Biennially</b> <ol style="list-style-type: none"> <li>For those &lt;40 yrs old.</li> <li>Same as in A.1.</li> </ol> </li> <li><b>Annually</b> <ol style="list-style-type: none"> <li>For those ≥40 yrs old.</li> <li>Same as in A.1.</li> </ol> </li> <li><b>Every 10 yrs, unless injury intervenes</b></li> <li>Booster doses of tetanus toxoid inoculations.</li> </ol>	<ol style="list-style-type: none"> <li>All employees shall be given a copy of their medical report upon termination of employment to take to his or her next employer.</li> </ol>	<ol style="list-style-type: none"> <li><b>After absence for injury of 5 or more days</b> <ol style="list-style-type: none"> <li>Medical exam to determine fitness.</li> </ol> </li> <li><b>In an emergency</b> <ol style="list-style-type: none"> <li>First aid, with emergency assistance and medical services, as necessary.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G / P O S T I N G</b>	<b>P R A C T I C E S / W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Logging (from felling to first haul) (NIOSH 76-188, 7/76)</b>			<ol style="list-style-type: none"> <li>1. Employees shall wear eye and face protection in accordance with 29 CFR 1910.133.</li> <li>2. Employee exposure to air contaminants shall be limited in accordance with 29 CFR 1910.93, and respiratory protection shall be in accordance with 29 CFR 1910.134.</li> <li>3. The employer shall comply with requirements of 29 CFR 1910.95 for noise exposure.</li> <li>4. When operating a chain saw, employees shall wear leg protection (chaps, pads, inserts) made from ballistic nylon or its equivalent.</li> <li>5. Depending on the requirements of the terrain and the timber, employees shall wear safety boots, safety shoes, or calked boots (excluding low-cut shoes). Safety-toe footwear shall be constructed in accordance with 29 CFR 1910.136.</li> <li>6. In areas where there are potential drowning hazards, employees shall wear flotation devices in accordance with 29 CFR</li> </ol>		<p align="center">Yes</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	<ol style="list-style-type: none"> <li>1. Safe work practices are a means of control.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Logging (from felling to first haul) (continued)</p>			<p>1918.106 and shall work within sight or sound of another person.</p> <p>7. When operating chain saws, filing sharp tools, or handling any kind of rope or cable, employees shall wear appropriate hand protection such as leather gloves.</p> <p>8. Employees shall wear head protection in accordance with 29 CFR 1910.135.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Malathion (NIOSH 76-205, 7/76)</b>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Physical exam:               <ol style="list-style-type: none"> <li>a. Frequent headaches, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol> <b>Biological monitoring</b> <ol style="list-style-type: none"> <li>2. All employees who are to be engaged in the manufacture or formulation of malathion shall have preexposure erythrocyte ChE baselines determined whenever their work histories allow an accurate pre-exposure determination. Those new employees with work histories precluding preexposure baseline ChE determinations shall have working baseline determinations performed.</li> <li>3. Within 60 days after the effective date of a standard, all present employees potentially exposed to malathion shall have working baseline erythrocyte ChE activities determined.</li> <li>4. An employee who has been removed from</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for all workers engaged in the manufacture or formulation of malathion, and retain at least 1 yr after termination of employment.</li> <li>2. Shall be available to DMR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Malathion (NIOSH 78-205, 7/76)</b>	<ol style="list-style-type: none"> <li>1. TWA: 15.</li> <li>2. Procedures for the collection and analysis of environmental air samples shall be as provided in Appendices I and II, or by any methods shown to be at least equivalent in accuracy, precision, and sensitivity to the methods specified.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Workers are not considered to have occupational exposure to malathion if environmental concentrations, as determined by an IH survey, do not exceed the action level.</li> <li>2. Surveys shall be repeated at least once every yr and within 30 days after any process change likely to result in increased airborne concentrations of malathion.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If airborne concentrations of malathion exceed the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees who are occupationally exposed to malathion.</li> <li>4. Interim monitoring of employee exposure to airborne concentrations of malathion shall be conducted at least every 6 mos.</li> <li>5. If monitoring of an employee's exposure to malathion reveals that the employee is exposed at</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Any employee whose work involves likely exposure of the skin to malathion or malathion formulations, e.g., mixing or formulating, shall wear full-body coveralls or the equivalent, impervious gloves, and impervious footwear, and when there is danger of malathion coming in contact with the eyes, safety goggles shall be provided and worn.</li> <li>2. Any employee who applies malathion shall be provided with and required to wear the following protective clothing and equipment: goggles, whole-body coveralls, and impervious footwear.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the appropriate respirator is worn.</li> <li>4. Canisters shall be discarded and replaced with fresh canisters in accordance with the manufacturer's recommendations or if the</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained.</li> <li>2. Records shall be maintained for at least 5 yrs and shall include sampling and analytical methods, types of respiratory protective devices used, and TWA concentrations found.</li> <li>3. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>4. These records shall be made available to the DR of the Sec. of HHS.</li> </ol>	<p align="center">Yes</p>	<p align="center">Yes</p>	<p align="center">Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to malathion at concentrations greater than 1/2 the TWA.</li> <li>2. Action level = 1/2 the TWA.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Malathion (continued)		malathion exposure shall not be allowed to return to work involving occupational malathion exposure until said employee's erythrocyte ChE activity has re- turned to at least 75% of the working or pre- exposure baseline value, or unless the responsible physician has approved said employee's return. 5. All employees shall be provided a copy of their initial, periodic, and any special ChE test results as soon as possible after the test, plus an interpretation.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Malathion (continued)</b>		concentrations in excess of the recommended TWA environmental limit, the exposure of that employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented to correct the situation. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the TWA environmental limit. Semi-annual monitoring may then be resumed.	odor of malathion breaks through. Unused canisters shall be discarded and replaced when seals are broken or on expiration of the manufacturer's recommended storage life if the seals are unbroken.  <b>Hygiene practices</b> 5. Sanitation measures specified.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Mercury (inorganic) (NIOSH 73-11024, 1/73)	1. Look for symptoms such as: a. Loss of weight; b. Sleeplessness; c. Tremors; d. Personality changes; e. CNS involvement.	<b>Annually</b> 1. Same as in A.	1. Retain 5 yrs after last occupational exposure for all employees subject to exposure. 2. Shall be available to DMR of the employer, of the Sec. of Labor, of the Sec. of HHS, and of the employee at his request.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Mercury (inorganic) (NIOSH 73-11024, 1/73)	1. TWA: 0.05.  2. Procedures for collection of environmental samples shall be as provided in Appendix I, or by a method shown to be equivalent. Analysis of samples shall be as provided in Appendix II, or by any method shown to be equivalent in sensitivity, accuracy, and precision.	1. Workroom areas where it has been determined, on the basis of an IH survey or the judgment of a compliance officer, that environmental levels do not exceed 40% of the environmental standard shall not be considered to involve worker exposure to inorganic mercury. An additional survey shall be made if there is a change in process or engineering controls.  2. When inorganic mercury exposures exist, employers shall monitor environmental levels of inorganic mercury at least every 6 mos. Breathing zone samples shall be collected to permit calculation of a TWA exposure for every operation.  3. When any TWA exposure is at or above the environmental standard, immediate steps shall be taken to reduce environmental levels. Samples shall be taken every 30 days until the environmental level has been reduced below the standard.	<b>Respiratory protection</b>  1. Appropriate respirators shall be provided and used when a variance has been granted to allow respirators as a means of control of routine operations and while the application is pending. Administrative controls can also be used to reduce exposure. Respirators shall also be provided and used for nonroutine operations (occasional brief exposures above the environmental standard and for emergencies).  2. Employees experiencing breathing difficulty while using respirators shall be evaluated by a physician to determine the ability of the worker to wear a respirator.  3. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the appropriate respirator.  4. Respiratory protective devices described in Table I-1 shall be either those approved under	1. IH survey records shall be kept.  2. Records shall be maintained for all sampling schedules to include the sampling and analytical methods, type of respiratory protection in use (if applicable), and the air concentrations of mercury in each work area.  3. Records shall be maintained so that each employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Occupational exposure = exposure to a concentration of inorganic mercury above 40% PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE - REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Mercury (inorganic)</b> (continued)			<p>30 CFR 11, published March 25, 1972, or under the following regulations:</p> <ul style="list-style-type: none"> <li>a. Gas masks—30 CFR 13 (Bureau of Mines Schedule 14 E);</li> <li>b. Self-contained breathing apparatus—30 CFR 11 (Bureau of Mines Schedule 13 E);</li> <li>c. Supplied air respirator—30 CFR 12 (Bureau of Mines Schedule 19 B).</li> </ul> <p><b>Protective clothing</b></p> <ul style="list-style-type: none"> <li>5. Each employee subject to exposure to inorganic mercury shall be provided coveralls or similar full-body work clothing, shoes or shoe covers, and hat, which shall be worn during the working hours in areas where there is exposure to inorganic mercury. A daily change of clean work clothing shall be supplied by the employer.</li> <li>6. Adequate shower facilities provided with hot and cold or tempered water shall be available for use and used by workers.</li> </ul>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Mercury (inorganic) (continued)</b>			7. Work and street clothing shall not be stored in the same locker.  <b>Hygiene practices</b> 8. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Methyl alcohol</b> <b>(NIOSH 76-148, 3/76)</b>	1. Comprehensive work history. 2. Physical exam, including: a. Ophthalmologic exam.	<b>Annually</b> 1. Same as in A.	1. Retain at least 5 yrs after termination of employment for all persons with occu- pational exposure and for maintenance personnel with occupational exposure. 2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S W O R K	ADDITIONAL INFORMATION
Methyl alcohol (NIOSH 76-148, 3/76)	<ol style="list-style-type: none"><li>1. TWA: 262 (200).</li><li>2. Ceiling limit for 15 min: 1,048 (800).</li><li>3. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods shown to be equivalent in precision, sensitivity, and accuracy to the methods specified.</li></ol>	<ol style="list-style-type: none"><li>1. Workroom areas where it has been determined on the basis of an IH survey that environmental levels are below 1/2 the TWA environmental limit are not considered to have occupational exposure to methyl alcohol.</li><li>2. Surveys shall be repeated when a process change indicates to a qualified person in authority the need for reevaluation.</li><li>3. Where there is occupational exposure to methyl alcohol, an adequate number of breathing zone samples shall be collected and analyzed to characterize the TWA and ceiling concentrations of each operation and work location in which there is occupational exposure to methyl alcohol.</li><li>4. This sampling and analysis shall be repeated every 6 mos except as otherwise indicated by a PIH.</li><li>5. Additional sampling and analysis shall be performed whenever changes in process, worksite, climate, or engineering control are</li></ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"><li>1. Appropriate protective clothing, including gloves, aprons, suits, boots, and face shields that are impervious to methyl alcohol, shall be provided and worn where needed to prevent repeated or prolonged skin contact.</li><li>2. Soap and water shall be made available to cleanse contaminated skin.</li><li>3. Unless clothing impervious to methyl alcohol is being worn, a change of clothing shall be made immediately available to and used by each employee whose clothes become contaminated with liquid methyl alcohol.</li></ol> <p><b>Eye protection</b></p> <ol style="list-style-type: none"><li>4. Chemical safety goggles or face shields shall be provided and worn in any operation in which there is a reasonable probability that methyl alcohol may be splashed into the eyes.</li></ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"><li>5. When permissible, the employer shall provide respirators in accordance</li></ol>	<ol style="list-style-type: none"><li>1. IH survey records shall be maintained until a new survey is completed.</li><li>2. Records shall be maintained and shall include sampling and analytical methods, types of respiratory protection used, and TWA and ceiling concentration found.</li><li>3. Each employee shall be able to obtain information on his or her own environmental exposures.</li><li>4. Records of occupational accidents and environmental exposures within the workplace shall be maintained for 5 yrs after the worker's employment has ended.</li><li>5. Shall be available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</li></ol>	Yes	Yes	Yes	<ol style="list-style-type: none"><li>1. Occupational exposure = exposure to methyl alcohol at or above the action level.</li><li>2. Action level = 1/2 the TWA.</li></ol>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING</p>	<p>POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Methyl alcohol (continued)</p>		<p>likely to cause an increase in airborne concentrations.</p> <p>6. If initial, periodic, or special evaluations indicate TWA or ceiling concentration limits are exceeded, corrective engineering or other control measures shall be promptly instituted to ensure the safety of employees, until concentrations below these environmental limits are achieved. In such cases, sampling of each operation and work location shall be conducted at least monthly until 2 consecutive 30-day sampling periods have shown that concentrations of methyl alcohol are at or below the workplace environmental limits.</p>	<p>with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>6. Where an emergency may develop which could result in employee overexposure to methyl alcohol, the employer shall provide respiratory protection as listed in Table I-1.</p> <p>Hygiene practices</p> <p>7. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Methyl chloromethyl ether</b> <b>(1910.1006, 8/80)</b>	<ol style="list-style-type: none"> <li>Physical exam with attn to: <ol style="list-style-type: none"> <li>Reduced immuno-competence;</li> <li>Steroid or cytotoxic treatments;</li> <li>Pregnancy;</li> <li>Smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including: <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and all employees considered for assignment to enter regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purposes of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Methyl chloromethyl ether (1910.1006)</b>		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where methyl chloromethyl ether is manufactured, processed, used, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where methyl chloromethyl ether is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in methyl chloromethyl ether</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of methyl chloromethyl ether in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which methyl chloromethyl ether is present in each regulated area.</li> <li>3. Incidents resulting in release of methyl chloromethyl ether into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Methyl chloromethyl ether (continued)</b></p>			<p>handling operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a full-face, supplied-air respirator of the continuous flow or pressure demand type in accordance with 1910.134.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>released, the amount of time involved, and an explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>				

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (NIOSH 77-106, 9/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Physical exam, with emphasis on: <ol style="list-style-type: none"> <li>a. Frequent headaches, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes;</li> <li>b. History of: <ol style="list-style-type: none"> <li>i. Glaucoma;</li> <li>ii. Cardiovascular disease;</li> <li>iii. Hepatic disease;</li> <li>iv. Renal disease;</li> <li>v. CNS disease.</li> </ol>                     (These individuals should be excluded from assignments exposed to methyl parathion.)                 </li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p>Annually, or as DBRP</p> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol> <p>Biological monitoring</p> <ol style="list-style-type: none"> <li>2. All employees who are to be occupationally exposed to methyl parathion shall have preexposure erythrocyte ChE baselines determined whenever their work histories allow an accurate preexposure determination. Those new employees with work histories precluding preexposure baseline erythrocyte ChE determinations shall have working ChE baseline determinations performed.</li> <li>3. Within 60 days after the effective date of this standard, all employees currently exposed to methyl parathion shall have their working baseline erythrocyte ChE activities determined.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 5 yrs after termination of employment for all workers exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employee, and of the employer.</li> <li>3. Include preexposure baseline erythrocyte ChE activity or working baseline ChE activity, and all ChE activities measured during employment.</li> </ol>	<p>If adverse health effects seen</p> <ol style="list-style-type: none"> <li>1. Appropriate medical services and surveillance.</li> </ol> <p>In an emergency</p> <ol style="list-style-type: none"> <li>2. First aid (see Appendix II of Reference).</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Methyl parathion (NIOSH 77-106, 9/76)</b>	<ol style="list-style-type: none"> <li>1. TWA: 0.2.</li> <li>2. Procedures for the calibration of sampling equipment and the collection and analysis of environmental air samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in accuracy, precision, and sensitivity.</li> </ol>	<ol style="list-style-type: none"> <li>1. Each employer involved in the manufacture or formulation of methyl parathion shall monitor environmental air levels of methyl parathion at least monthly, except as specified otherwise by a PIH.</li> <li>2. If monitoring of an employee's exposure to methyl parathion reveals that the employee is exposed at concentrations in excess of the recommended TWA environmental limit, control measures shall be initiated and the employee shall be notified of that exposure and the control measures being implemented to correct the situation. Monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the TWA environmental limit. Monthly monitoring may then be resumed.</li> <li>3. Air samples shall be collected in the breathing zone of employees to permit calculation of TWA</li> </ol>	<b>Protective clothing</b> <ol style="list-style-type: none"> <li>1. Any employee who engages in filling containers of, pouring, mixing, formulating, loading, applying, or otherwise handling methyl parathion (including open-system manufacturing processes) shall be provided with, and required to wear, protective head covering, goggles and face shield, impervious gloves, full-body coveralls, impervious apron or rainsuit, and impervious footwear. Impervious gloves should have reverse gauntlets and coveralls should be of a closely woven material (siliconized fabric, such as nylon or cotton) and without cuffs.</li> <li>2. Employees handling sealed, nonleaking containers of methyl parathion shall be provided with, and required to wear, full-body coveralls or the equivalent and impervious gloves.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sampling records shall be maintained so that exposure information is available for individual employees.</li> <li>2. These records shall indicate, in addition to the results of air sampling, the type of personal protective device, if any, in use by each employee at the time of sampling, and the sampling and analytical methods used.</li> <li>3. Records shall be maintained for 5 yrs after the worker's employment has ended.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>5. Shall be made available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = employment in any area in which methyl parathion or materials containing methyl parathion, alone or in combination with other substances, is produced, packaged, processed, mixed, blended, handled, stored in large quantities, or applied.</li> <li>2. Greatest danger to employees is skin contact.</li> </ol>



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (continued)		4. Subsequent to the determination of a pre- exposure or working baseline, all employees occupationally exposed to methyl parathion shall have their erythro- cyte ChE activities determined at 4-wk intervals, except for those employees in the following occupations who shall be tested at 2-wk intervals: mixers, loaders, ground applica- tors, aerial applicators, flaggers, personnel who clean or repair equipment or clean up methyl parathion spills, checkers or field workers entering fields still wet from appli- cation or otherwise presenting a reasonable potential for adverse exposure, and em- ployees engaged in manufacturing or for- mulating in other than		

OBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Methyl parathion (continued)</p>		<p>values for every methyl parathion exposure area. For each TWA determination, a sufficient number of samples shall be taken to characterize each employee's exposure during each workday. Variations in work and production schedules shall be considered in deciding when samples are to be collected. The number of representative TWA determinations for an operation or process shall be based on the variations in location and job functions of employees in relation to that operation or process.</p>	<p>3. Employees operating open equipment for ground (non-aerial) application of methyl parathion shall be provided with, and required to wear, protective head coverings or face shields, impervious gloves, full-body coveralls or impervious rainsuits, and impervious footwear.</p> <p>4. Employees applying methyl parathion from closed-cockpit aircraft shall be provided with impervious gloves. Employees applying methyl parathion by open-cockpit aircraft shall be provided with, and required to wear, full-body coveralls or impervious rainsuits and goggles, and shall be provided with impervious gloves.</p> <p>5. Employees acting as flaggers (other than those flagging from enclosures) in the aerial application of methyl parathion shall be provided with, and required to wear, full-body coveralls or</p>					

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (continued)		<p>closed production, mixing, blending, transfer, or packaging systems. This 2-wk interval shall be reduced to 1 wk for any em- ployee working longer than 12 hrs during any workday. This shorter interval shall be main- tained until at least one entire workweek has elapsed without a work- day exceeding 12 hrs.</p> <p>5. Unacceptable ab- sorption of methyl parathion indicating a failure of control pro- cedures or work practices is demon- strated when the enzymatic activity of erythrocyte ChE is decreased between 60 and 70% of the em- ployee's preexposure baseline or working baseline level. The employee shall be</p>		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELLING</b>	<b>POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
<b>Methyl parathion (continued)</b>			<p>impervious rainsuits, protective head and neck covering, impervious footwear, and impervious gloves.</p> <p>6. Where toxic residues present a reasonable potential for exposure, employees entering areas treated with methyl parathion shall be provided with, and required to wear, impervious gloves, full-body coveralls or impervious rainsuits, face shields (if foliage is likely to contact the face), and impervious footwear.</p> <p>7. Laundry personnel handling clothing contaminated with methyl parathion shall be provided with, and required to wear, impervious gauntlet gloves, impervious footwear, and, in addition to ordinary clothes, impervious aprons.</p> <p>8. Employees applying methyl parathion in greenhouses or other enclosures, or entering such enclosures while</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (continued)		advised of this finding, and an industrial hygiene survey shall be conducted in the workplace of the affected employee unless the cause of exposure is known and corrective action has been initiated. This survey shall include an assessment of the dermal exposure potential. Based on the results of this survey, necessary corrective action shall be accomplished. In addition, an employee whose erythrocyte ChE determination indicates that the employee's erythrocyte ChE activity is decreased to 60% of, or below, preexposure or working baseline, shall be removed from potential exposure to methyl parathion and placed under medical		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G P O S T I N G</p>	<p>P R A C T I C E S W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Methyl parathion (continued)</b></p>			<p>foliage is still wet from an application or while dust is still airborne, shall be provided with, and required to wear, impervious rainsuits, hoods, neck coverings, impervious gauntlet gloves, and impervious boots.</p> <p>9. Employees (such as cleanup personnel) entering areas contaminated with methyl parathion shall be provided with, and required to wear, impervious gloves, full-body coveralls or impervious rainsuits, impervious footwear, impervious aprons, and such other personal protective equipment as may be required for adequate protection against the particular hazards present.</p> <p>10. Protective clothing shall not be taken home by employees. The employer shall provide for maintenance and laundering of protective clothing.</p>					

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (continued)		<p>observation. In such cases, an industrial hygiene survey shall be conducted in the workplace of the affected employee unless the cause of the exposure is known and corrective action has been taken. This survey shall include an assessment of the dermal exposure potential. Based on the results of this survey, necessary corrective action shall be accomplished.</p> <p>6. An employee who has been removed from methyl parathion exposure shall be prohibited from returning to work involving exposure to methyl parathion until the erythrocyte ChE activity has returned to at least 75% of the working or preexposure baseline value.</p>		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Methyl parathion (continued)</p>			<p><b>Respiratory protection</b></p> <p>11. When permissible, the employee shall provide respirators in accordance with Table I-1 and shall ensure that the appropriate respirator is worn.</p> <p>12. Employees experiencing breathing difficulties while wearing respiratory protective devices shall be medically examined to determine their ability to wear such devices. If it is determined that an employee cannot breathe adequately while wearing a respirator, the employee shall be assigned to work which does not require the use of a respirator.</p> <p>13. Canisters or cartridges shall be discarded and replaced with fresh canisters or cartridges as recommended by the manufacturer, or immediately if the user has difficulty breathing; if the user smells methyl parathion or methyl parathion-containing formulations, diluents, emulsifiers, or solvents</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Methyl parathion (continued)		7. Each employee shall be given, as soon as possible, a copy of the results of said employee's initial, periodic, or special ChE tests and a pro- fessional interpretation of the results.		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Methyl parathion (continued)</b>			<p>while using the respirator; or if a breakthrough indicator (if any) indicates that the absorbent is saturated. Filters shall be changed whenever canisters or cartridges are changed, or after every 4 hrs of use, or if breathing becomes difficult, whichever occurs first. Unused canisters or cartridges shall be discarded and replaced when the seals are broken, or on the expiration of the manufacturer's recommended storage life if the seals are unbroken.</p> <p>14. Except in emergencies, respirators other than the cooled supplied-air type shall be used no longer than 15 min if the ambient temperature exceeds 85°F in the workplace.</p> <p>15. Where an emergency develops which could result in overexposure of employees to methyl parathion, the employer shall provide respiratory protection as indicated in Table I-1.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Methyl parathion (continued)			<p>16. Application of methyl parathion or methyl parathion formulations is a routine operation in which respirators must be used if the TWA is exceeded.</p> <p><b>Hygiene practices</b></p> <p>17. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>4,4-Methylene bis (2-chloroaniline) (1910.1005, 11/78) [Deleted as OSHA Standard, August 20, 1976]</b></p>	<ol style="list-style-type: none"> <li>1. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Decreased immuno-competence;</li> <li>b. Treatment with steroid or cytotoxic agent;</li> <li>c. Pregnancy;</li> <li>d. Cigarette smoking.</li> </ol> </li> <li>2. Personal, family, and occupational histories, including:               <ol style="list-style-type: none"> <li>a. Genetic factors;</li> <li>b. Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment for all authorized employees and all employees considered for assignment to enter regulated areas.</li> <li>2. Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>3. Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b>  <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Methylene chloride (NIOSH 76-138, 3/76)</b>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, including:               <ol style="list-style-type: none"> <li>a. Headache, dizziness, fatigue;</li> <li>b. Pain in limbs;</li> <li>c. Skin and eye irritation.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Blood count (hemoglobin, red blood cells);</li> <li>b. Autonomic function for clinical impression;</li> <li>c. Pulmonary function for clinical impression.</li> </ol> </li> <li>3. Use of respirators.</li> </ol>	<b>Annually, or as DBRP</b> 1. Same as in A.1 and 2.  <b>Quarterly</b> 2. Carboxyhemoglobin values.	<ol style="list-style-type: none"> <li>1. Retain for persons employed 1 or more yrs in work involving methylene chloride.</li> <li>2. Retain 5 yrs after termination of employment.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Methylene chloride</b> (NIOSH 76-138, 3/76)</p>	<p>1. In the absence of occupational exposure to CO above 9 ppm, TWA: 261 (75).</p> <p>2. In the presence of CO at more than 9 ppm, exposure limits of CO or methylene chloride or both shall be reduced to satisfy the relationship:</p> $\frac{C(CO)}{L(CO)} + \frac{C(CH_2Cl_2)}{L(CH_2Cl_2)} < 1$ <p>where</p> <p>C(CO) = TWA of CO in ppm</p> <p>L(CO) = the recommended TWA of CO: 35 ppm</p> <p>C(CH<sub>2</sub>Cl<sub>2</sub>) = TWA of methylene chloride in ppm</p> <p>L(CH<sub>2</sub>Cl<sub>2</sub>) = the recommended TWA of methylene chloride: 75 ppm</p> <p>3. Ceiling limit for 15 min: 1,740 (500).</p>	<p>1. Where it has been determined that the environmental concentrations do not result in TWA workday exposures above 1/2 the TWA environmental limit, environmental monitoring is not required.</p> <p>2. Exposure surveys shall be made when any process change indicates the need for reevaluation or at the discretion of the compliance officer.</p> <p>3. Where it has been determined that environmental concentrations exceed 1/2 the environmental limit, samples shall be collected at least every 6 mos.</p> <p>4. Environmental samples shall be taken when a new process is installed or when process changes are made which may cause an increase in environmental concentration. Increased production, relocation of existing operations, and increased overtime also require resampling.</p> <p>5. In all monitoring, samples shall be collected which are representative of</p>	<p><b>Protective clothing</b></p> <p>1. In any operation where the worker may come into direct contact with liquid methylene chloride, protective clothing shall be worn.</p> <p>2. The clothing shall be both impervious and resistant to methylene chloride.</p> <p>3. Gloves, boots, overshoes, and bib-type aprons (at least knee length) shall be provided when necessary.</p> <p>4. Impervious supplied air hoods or suits shall be worn when entering confined spaces such as pits or tanks.</p> <p>5. In situations where heat stress is likely to occur, air-supplied suits shall be used.</p> <p>6. All protective clothing shall be well aired and inspected for physical defects prior to reuse.</p> <p><b>Eye protection</b></p> <p>7. Eye protection shall be provided for any employee engaged in an operation where methylene chloride liquid or spray may enter the eye.</p>	<p>1. Records which form the basis for concluding that the exposures are below 1/2 the limit shall be maintained.</p> <p>2. All records of sampling and of pertinent medical examinations shall be maintained for at least 5 yrs after the individual's employment is terminated.</p> <p>3. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling.</p> <p>4. Each employee shall be able to obtain information on his or her own environmental exposures.</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION							
Methylene chloride (continued)	<p>4. The toxicities of CO and methylene chloride are additive; thus, the PEL must be reduced in the presence of CO. When CO levels exceed 9 ppm, the occupational exposure must be determined by the following formula:</p> $\frac{C(CO)}{L(CO)} + \frac{C(CH_2Cl_2)}{L(CH_2Cl_2)} < 0.6$ <p>5. Procedures for sampling and analysis of workroom air for methylene chloride shall be as provided in Appendices I and II, or by any equivalent method.</p> <p>6. Where required, monitoring of workroom air for CO shall be</p>	<p>breathing-zone exposures characteristic of each job or specific operation in each work area. Sufficient numbers of samples shall be collected to express the variability of exposure for the work situation and to estimate TWA workday exposures and peak exposures for every employee.</p> <p>6. The minimum number of representative TWA exposure determinations for an operation or process shall be based on variation in exposures, and production schedules, considering the number of workers exposed as seen in the table below.</p> <table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>8. Chemical-type goggles, safety glasses with splash shields, or plastic face shields made completely of methylene chloride-resistant materials shall be used.</p> <p><b>Respiratory protection</b></p> <p>9. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>10. Industrial size and chin-type canisters shall not be used except for escape.</p> <p>11. Chemical cartridge respirators shall not be used with methylene chloride.</p> <p>12. Where an emergency may develop which could result in employee injury from overexposure to methylene chloride, the employer shall provide respiratory protection as listed in Table I-1.</p>					
Number of Employees Exposed	Number of TWA Determinations															
1-20	50% of the number of workers															
21-100	10 plus 25% of the excess over 20 workers															
> 100	30 plus 5% of the excess over 100 workers															

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Methylene chloride (continued)</b>	in accord with the sampling requirements of this and the CO standard. Recommended methods for sampling and analysis of workroom air for CO are given in <b>Criteria for a recommended standard . . . Occupational Exposure to Carbon Monoxide.</b>	7. When exposure levels are found to be greater than the PEL, environmental concentrations shall be reduced by suitable engineering controls. Exposures shall be monitored at least weekly until the effectiveness of the controls is established.							

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>α-Naphthylamine</b> (1910.1004, 11/78)	<ol style="list-style-type: none"> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Reduced immuno-competence;</li> <li>Steroid or cytotoxic treatments;</li> <li>Pregnancy;</li> <li>Smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including: <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p>At least annually</p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and employees considered for assignment to enter regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employee ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
<b>α-Naphthylamine (1910.1004)</b>		<div>1. A regulated area shall be established where α-naphthylamine is manufactured, processed, used, repackaged, released, handled, or stored.</div> <div>2. Access shall be restricted to authorized personnel.</div>	<div><b>Protective clothing</b></div> <div>1. In operations involving "laboratory-type hoods," or where α-naphthylamine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</div> <div>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</div> <div><b>Respiratory protection</b></div> <div>3. Employees engaged in α-naphthylamine handling operations involving transfer from a closed</div>	<div>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</div> <div>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of α-naphthylamine in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which α-naphthylamine is present in each regulated area.</div> <div>3. Incidents resulting in release of α-naphthylamine into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</div> <div>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an</div>	Yes	Yes	Yes	<div>1. Open vessel system operations are prohibited.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
α-Naphthylamine (continued)			<p>system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>					



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b><math>\beta</math>-Naphthylamine</b> (1910.1009, 11/78)	<ol style="list-style-type: none"> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Reduced immuno-competence;</li> <li>Steroid or cytotoxic treatments;</li> <li>Pregnancy;</li> <li>Smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including: <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and employees considered for assignment to enter regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>β-Naphthylamine (1910.1008)</b>		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where β-naphthylamine is manufactured, processed, used, repackaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where β-naphthylamine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in β-naphthylamine handling operations involving</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of β-naphthylamine in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which β-naphthylamine is present in each regulated area.</li> <li>3. Incidents resulting in release of β-naphthylamine into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>β-Naphthylamine</b> (continued)			<p>transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>				

## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>Nickel (inorganic) (NIOSH 77-164, 5/77)</b></p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>a. Skin conditions or allergies;</li> <li>b. Illness or sensitizations of upper and lower respiratory system;</li> <li>c. Smoking history.</li> </ol> </li> <li>2. Complete physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Upper respiratory tract membranes for evidence of bleeding, irritation, ulcers, and perforations;</li> <li>b. Skin, for evidence of dermatitis or irritation.</li> </ol> </li> <li>3. Clinical tests:               <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. Pulmonary function test (FEV1.0, FVC);</li> <li>c. Sputum cytology as DBRP;</li> <li>d. Nickel and protein concentrations in urine;</li> <li>e. Chronic respiratory disease, as assessed by questionnaire.</li> </ol> </li> <li>4. Use of positive or negative pressure respirator.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 40 yrs after last occupational exposure for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>1. Appropriate medical services.</li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>2. If contamination of wound by nickel:               <ol style="list-style-type: none"> <li>a. Prompt and thorough washing of wound.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELING</b>	<b>POSTING</b>	<b>PRACTICES</b>	<b>ADDITIONAL INFORMATION</b>
<b>Nickel (inorganic)</b> <b>(NIOSH 77-164, 5/77)</b>	1. TWA: 15 µg/m <sup>3</sup> .  2. The TWA concentration limit represents the lowest reliably detectable concentration of nickel measurable by the recommended sampling and analytical methods selected. Procedures for the collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any methods at least equivalent in accuracy, precision, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b>  1. Each employer who has a place of employment in which nickel is refined, handled, stored, or otherwise used shall determine by an IH survey if occupational exposure to nickel may occur.  2. Surveys shall be repeated at least once every yr and within 30 days of any process change likely to result in occupational exposure to nickel.  <b>Personal monitoring</b>  3. If occupational exposure to nickel is possible, a program of personal monitoring shall be instituted to measure or permit calculation of the exposure of all employees.  4. Each operation in each work area shall be sampled at least once every 3 mos.  5. If an employee is found to be exposed to nickel in excess of the recommended TWA concentration limit, the exposure of that employee shall be measured at least once a wk, control measures shall be initiated,	<b>Protective clothing</b>  1. The employer shall provide appropriate protective clothing, such as gloves, aprons, suits, hats, or face shields, for employees, such as platers, who are likely to have appreciable skin contact with nickel, and for those who are especially sensitive to nickel.  <b>Eye protection</b>  2. The employer shall provide safety goggles or face shields (8 in minimum) with goggles and shall ensure that employees wear the protective equipment during any operation in which nickel may enter the eyes.  <b>Respiratory protection</b>  3. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that employees use the respirators in a proper manner when the concentration of airborne nickel exceeds the recommended TWA concentration limit.  4. Escape equipment shall be located at clearly identified	1. IH survey records shall be retained until the next survey is completed.  2. Environmental monitoring records shall be maintained for at least 40 yrs after the employee's last occupational exposure to nickel.  3. These records shall include the dates and times of measurements, job function and location of employees within the worksite, methods of sampling and analysis used, types of respiratory protection in use at the time of sampling, TWA concentrations found, and identification of exposed employees.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. Daily rosters of authorized persons who enter regulated areas shall be retained for 40 yrs.  6. Environmental monitoring records and entry rosters shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.	Yes	Yes	Yes		1. Occupational exposure = working with compounds, solutions, or metals containing nickel that can become airborne or can spill or splash on the skin or in the eyes.

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Nickel (inorganic) (continued)</p>		<p>and the employee shall be notified of the extent of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended TWA concentration limit. Routine monitoring may then be resumed.</p> <p>6. Regulated areas shall be established and access limited if concentrations exceed the PEL.</p>	<p>stations within the work area and shall be adequate to permit all employees to escape safely from the area. Protective equipment suitable for emergency entry shall be located at clearly identified stations outside the work area.</p> <p><b>Hygiene practices</b></p> <p>5. Sanitation measures specified.</p>					



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Nickel carbonyl (NIOSH 77-184, no date) [Special Health Hazards Review]</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on: <ol style="list-style-type: none"> <li>a. Lungs;</li> <li>b. Upper respiratory tract.</li> </ol> </li> <li>2. Physical exam.</li> <li>3. Tests: <ol style="list-style-type: none"> <li>a. Pulmonary function tests;</li> <li>b. Urinary nickel content;</li> <li>c. 14" x 17" post/ant chest X-ray.</li> </ol> </li> <li>4. Ability to use positive pressure respirator.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol> <p><b>Monthly</b></p> <ol style="list-style-type: none"> <li>2. Samples of urine nickel content.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment and for 40 yrs following termination of employment.</li> <li>2. Include the name of the employee, all information obtained from medical examinations which is pertinent to nickel carbonyl exposure, all employee medical complaints relative to exposure to nickel carbonyl, and any treatment for exposure to nickel carbonyl and the results of that treatment.</li> <li>3. Shall be available to DMR of the Assistant Sec. of Labor for OSHA and the Director of NIOSH.</li> <li>4. All employees should have access to the exposure measurement records which indicate their own exposure.</li> <li>5. Shall be available upon written request to a physician designated by the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Nitric acid (NIOSH 76-141, 3/76)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive work and medical histories.</li> <li>2. 14" x 17" post/ant chest X-ray.</li> <li>3. Pulmonary function tests (FVC, FEV1.0 as minimum).</li> <li>4. Visual exam of teeth for evidence of dental erosion.</li> <li>5. Use of negative or positive pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> <li>2. Proper management if exposed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for persons employed 1 or more yrs in work involving exposure.</li> <li>2. Retain X-rays for the 5 yrs preceding termination of employment and all medical records at least 20 yrs after termination of employment.</li> <li>3. Shall be available to the DMR of the Sec. of HHS, of the Sec. of Labor, and of the employer.</li> <li>4. Physicians designated and authorized by any employee shall have access to that worker's records.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Nitric acid (NIOSH 76-141, 3/76)	1. TWA: 5 (2).  2. Procedures for sampling, calibration of equipment, and analysis shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b>  1. Workers are considered occupationally exposed to nitric acid if environmental levels, as determined on the basis of an IH survey, equal or exceed 1/2 of the TWA limit.  2. Surveys shall be repeated within 30 days of installing new equipment or processes, process modifications, or worksite changes which are likely to result in an increase of airborne nitric acid.  <b>Personal monitoring</b>  3. If nitric acid levels are equal to or exceed 1/2 the TWA, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to nitric acid.  4. Routine monitoring of employee exposure shall be conducted at least semiannually.  5. If an employee monitoring program measurement reveals that an employee is exposed in excess of the recommended limit, the	<b>Protective clothing</b>  1. Skin contact with concentrated nitric acid will produce burns at the site of contact. Impervious protective clothing, such as rubber gloves, aprons, suits, and boots shall be provided by the employer and used by the employee when there is a likelihood of body contact with liquid acid.  2. Nitric acid-wetted clothing shall be flooded with water and then removed promptly.  3. All protective clothing and equipment shall be maintained in a clean, sanitary, and workable condition.  <b>Eye protection</b>  4. Eye protective equipment shall be provided by the employer and used by the employee where potential for eye contact with liquid nitric acid exists.  5. Cup-type, cover-cup-type, or rubber-framed goggles, equipped with approved impact-resistant glass or plastic lenses, shall be worn whenever using or handling concentrated nitric acid.	1. IH survey records shall be maintained.  2. The employer shall keep records on all IH surveys and all breathing zone TWA determinations.  3. Records of the latter shall include the determined concentration of exposure and a description of the monitoring, sampling, and analytical methods. In addition, records shall be maintained on the types of respirators and personal protective equipment, if any, worn by employees.  4. The monitoring records shall identify the employees for whom breathing zone air samples were collected.  5. The employer shall make sure records are available to representatives of the Sec. of HHS, of the Sec. of Labor, and to the employee or former employee.  6. The employer shall keep the records of all environmental monitoring on the levels of airborne nitric acid for each employee for whom breathing zone air samples were collected for at least 20 yrs after the employee's employment is terminated.	Yes	Yes	Yes	1. Occupational exposure = exposure to airborne concentrations of nitric acid equal to or exceeding 1/2 the TWA.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Nitric acid (continued)</p>		<p>exposure of that employee shall be monitored at 15-day intervals. Measures designed to control employee exposure to nitric acid shall be implemented, and the employee shall be notified of his or her exposure as well as the control measures being implemented. Monitoring shall continue until 2 consecutive determinations indicate that employee exposure no longer exceeds the recommended environmental limit. Semiannual monitoring may then be resumed.</p>	<p>6. If there is danger of nitric acid striking the eyes or around the sides of the face, a full-length (8 in minimum) plastic shield with forehead protection shall be worn in addition to chemical safety goggles.</p> <p><b>Respiratory protection</b></p> <p>7. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>8. Emergency and escape-type respirators shall be made immediately available at the work stations for each worker.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Nitriles (NIOSH 78-212, 9/78)	<ol style="list-style-type: none"> <li>1. Medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Skin disorders;</li> <li>b. Cardiopulmonary conditions;</li> <li>c. Nervous system disorders.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Cardiovascular system;</li> <li>c. Pulmonary system;</li> <li>d. Central nervous system.</li> </ol> </li> <li>3. Clinical tests:               <ol style="list-style-type: none"> <li>a. 14" x 17" chest X-ray;</li> <li>b. Pulmonary function tests (FEV1.0, FVC).</li> </ol> </li> <li>4. Use of positive pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Interim medical and work histories.</li> <li>2. Physical exam as in A.2 and A.3, with exception of chest X-ray.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termi- nation of employment for all workers subject to exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>In an emergency</b> <ol style="list-style-type: none"> <li>1. First aid (see Appendix III of Reference).</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Nitriles</b> <b>(NIOSH 78-212, 9/78)</b>	<p>1. TWA: acetonitrile: 34 (~20); propionitrile: 14 (~6); n- butyronitrile: 22 (~8); iso- butyronitrile: 22 (~8); malononitrile: 8 (~3); adiponitrile: 18 (~4); succinonitrile: 20 (~6). Ceiling limit for 15 min: acetone cyanohydrin: 4 (~1); glycolonitrile: 5 (~2); tetramethyl succinonitrile: 6 (~1).</p> <p>2. When there is simultaneous exposure to several nitriles or other sources of cyanide, the exposures shall be regarded as additive. The PEL shall be determined</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Employers shall conduct an IH survey at locations where nitriles are released into workplace air to determine whether exposure to airborne concentrations of nitriles is in excess of the action level.</p> <p>2. Surveys shall be repeated at least annually and within 30 days of any process change likely to alter concentrations of any of these compounds in the workplace air.</p> <p><b>Personal monitoring</b></p> <p>3. If it has been concluded that the environmental concentrations of nitriles exceed the action level, a program of personal monitoring shall be instituted to identify and measure, or permit calculations of, the exposure of each employee occupationally exposed to nitriles.</p> <p>4. Source and area monitoring may be used to supplement personal monitoring.</p> <p>5. If an employee is found to be exposed above the</p>	<p><b>Protective clothing</b></p> <p>1. The employer shall provide appropriate protective clothing made of material resistant to penetration by nitriles, including gloves, aprons, coveralls, and boots, and shall ensure that employees wear protective clothing when necessary to prevent skin contact.</p> <p>2. The employer shall ensure that personal protective clothing is regularly inspected for defects.</p> <p><b>Eye protection</b></p> <p>3. The employer shall provide <i>chemical safety goggles or face shields</i> (20 cm or 8 in minimum) and goggles, and shall ensure that employees wear the protective equipment during any operation where eye contact with liquid nitriles is likely.</p> <p><b>Respiratory protection</b></p> <p>4. The use of respiratory protective equipment is permitted only in the following circumstances:</p> <p>a. During the time necessary to install or test the required engineering controls;</p>	<p>1. IH survey records shall be kept.</p> <p>2. Employers or their successors shall keep records of environmental monitoring for each employee for at least 30 yrs after the individual's employment has ended.</p> <p>3. These records shall include an identification of the employee being monitored, duties and job locations within the worksite, dates of measurements, sampling and analytical methods used and evidence of their accuracy, duration of sampling, number of samples taken, results of analyses, TWA or ceiling concentrations based on these samples, and any personal protective equipment used.</p> <p>4. Records for each employee, indicating date of employment with the company and any changes in job assignment, shall be kept for the same 30-yr duration.</p> <p>5. The employer shall make these records available upon request to authorized</p>	Yes	Yes	Yes	<p>1. Occupational exposure = exposure to airborne concentrations of nitriles at or above 1/2 the TWA.</p>



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Nitriles (continued)	<p>from the following equation:</p> $E_m = C_1/L_1 + \dots + C_n/L_n$ <p>where:</p> <p><math>C_1</math> = the concentration of the main component of the mixture</p> <p><math>C_n</math> = the concentration of other constituents with n having values from 2 to n</p> <p><math>L_1</math> = the PEL for the main component</p> <p><math>L_n</math> = the PELs for other constituents, with n having values from 2 to n</p> <p><math>E_m</math> = shall not exceed 1</p> <p>3. When the additive formula exceeds 1 for compounds with ceiling limits, exposure shall be reduced even if none of the individual limits are exceeded.</p> <p>4. Workplace air samples shall be collected and analyzed for nitriles as described in Appendix I, or</p>	<p>action level but below the PEL, the exposure of that employee shall be monitored at least once every 3 mos.</p> <p>6. If an employee is found to be exposed in excess of the recommended environmental limit, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that employee exposure no longer exceeds the recommended environmental concentration limit; quarterly monitoring shall then be resumed.</p> <p>7. Employees shall be given the opportunity to observe any monitoring conducted based on the NIOSH recommendations.</p>	<p>b. For operations such as maintenance and repair activities causing brief exposure at concentrations in excess of the recommended environmental limits;</p> <p>c. During sampling of process streams;</p> <p>d. During emergencies when concentrations of airborne nitriles might exceed the recommended environmental limits.</p> <p>e. Whenever a self-contained breathing apparatus is supplied for escape purposes, the respirator shall be operated in the pressure-demand or continuous-flow mode.</p> <p>5. The employer shall ensure that employees are properly instructed in the use of respirators assigned to them and in how to test for leakage, proper fit, and proper operation as judged by quantitative fit tests. Quantitative faceseal fit test procedures using sodium chloride, dioctyl phthalate, or the equivalent shall be used.</p>	<p>representatives of the Sec. of Labor and of the Sec. of HHS.</p> <p>6. Employees or authorized representatives shall have access to information on their own exposures.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p>Nitriles (continued)</p>	<p>by any method shown to be at least equivalent in accuracy, precision, and sensitivity.</p>		<p>For full-facepiece cartridge respirators, the maximum allowable leakage is 2% of the test atmosphere.</p> <p>6. The employer shall provide respirators in accordance with Tables I-2 and I-3, and shall ensure that employees use the respirators properly when they are required.</p> <p>7. When a self-contained breathing apparatus is permitted in accordance with these tables, it shall be used pursuant to the following requirements:</p> <p>a. The employer shall provide initial training and refresher courses on the use, maintenance, and function of a self-contained breathing apparatus;</p> <p>8. Emergency equipment shall be located at clearly identified stations within the work area and shall be adequate to permit all employees to escape safely from the area. Protective equipment suitable for emergency use shall be located at clearly identified</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Nitriles (continued)			stations outside the work area.  <b>Hygiene practices</b>  9. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>4-Nitrobiphenyl</b> <b>(1910.1003, 11/78)</b>	1. Physical exam, with attn to: a. Reduced immuno-competence; b. Steroid or cytotoxic treatments; c. Pregnancy; d. Smoking. 2. Personal, family, and occupational histories, including: a. Genetic factors; b. Environmental factors.	<b>At least annually</b> 1. Same as in A.	1. Retain for the duration of employment for all authorized employees and all employees considered for assignment to regulated areas. 2. Upon termination of employment, including retirement or death, or in the event that the employer ceases to do business without a successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director of NIOSH. 3. Provide upon request to employees, DMR, the Assistant Sec., and Director of NIOSH. 4. Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
4-Nitrobiphenyl (1910.1003)		<div>1. A regulated area shall be established where 4-nitrobiphenyl is manufactured, processed, used, repackaged, released, handled, or stored.</div> <div>2. Access shall be restricted to authorized employees only.</div>	<div>Protective clothing</div> <div>1. In operations involving "laboratory-type hoods," or where 4-nitrobiphenyl is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</div> <div>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</div> <div>Respiratory protection</div> <div>3. Employees engaged in 4-nitrobiphenyl handling operations involving transfer from a closed</div>	<div>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</div> <div>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of 4-nitrobiphenyl in each regulated area; the number of employees in each area during normal operations and maintenance activities; and the manner in which 4-nitrobiphenyl is present.</div> <div>3. Incidents resulting in release of 4-nitrobiphenyl into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</div> <div>4. A written report shall be filed within 15 days of such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an explanation of the procedure used in determining this figure; a</div>	Yes	Yes	Yes	<div>1. Open vessel system operations are prohibited.</div>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>4-Nitrobiphenyl (continued)</b></p>			<p>system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>					

### MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Nitroglycerin and Ethylene glycol dinitrate (NIOSH 78-167, 6/78)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special attn to:               <ol style="list-style-type: none"> <li>a. Disorders of the cardiovascular system.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Cardiovascular system;</li> <li>b. Central and peripheral nervous system;</li> <li>c. Skin.</li> </ol> </li> <li>3. Record:               <ol style="list-style-type: none"> <li>a. Pulse rate;</li> <li>b. BP;</li> <li>c. ECG at rest, during, and after exercise (Master's test).</li> </ol> </li> <li>4. Ability to use positive pressure respirator.</li> </ol>	<p><b>Semi-annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, and 3.</li> </ol> <p><b>Daily (ideally)</b></p> <ol style="list-style-type: none"> <li>2. Pulse rate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all exposed employees.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to the DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. In the event of illness known or suspected to be due to NG or EGDN:               <ol style="list-style-type: none"> <li>a. Same as in A.2.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Nitroglycerin and Ethylene glycol dinitrate (NIOSH 78-167, 6/78)	<div>1. Ceiling limit for 20 min: 0.1.</div> <div>2. Procedures for the collection and analysis of workroom air samples for compliance with the recommended standard shall be as provided in Appendix I, or by any method shown to be at least equivalent in precision, sensitivity, accuracy, and safety to those specified.</div>	<div>Industrial hygiene survey</div> <div>1. Each employer with a place of employment where NG, EGDN, or explosives containing these compounds are manufactured, processed, handled, stored, or otherwise used shall determine by an IH survey whether occupational exposure to NG or EGDN may occur.</div> <div>2. Surveys shall be repeated at least annually and within 30 days of any process or engineering change.</div> <div>Personal monitoring</div> <div>3. If it is determined that there is occupational exposure to NG or EGDN, the employer shall institute a program of personal monitoring to measure or permit calculation of the exposure of each employee. Source and area monitoring may be used to supplement personal monitoring.</div> <div>4. Each operation in each work area shall be evaluated at least every 3 mos for conditions that</div>	<div>Protective clothing</div> <div>1. The employer shall provide a daily change of clean work clothing intended to minimize access of dust to the skin of employees in areas where NG or EGDN are present.</div> <div>2. Work clothing shall be changed immediately when soiled with liquid NG or EGDN.</div> <div>3. Rubber or plastic gloves with a cotton lining or plain cotton gloves shall be provided for employees who may have skin contact with NG or EGDN.</div> <div>4. The gloves shall be changed at least daily. Cotton gloves shall be changed immediately if they become contaminated with liquid NG or EGDN.</div> <div>5. Since natural and synthetic rubber are pervious to NG and EGDN, unlined gloves made of these materials should not be used.</div> <div>Respiratory protection</div> <div>6. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall</div>	<div>1. IH survey records shall be maintained.</div> <div>2. Environmental monitoring records shall be retained for at least 30 yrs after the employee's last occupational exposure to NG or EGDN.</div> <div>3. These records shall include the dates and times of measurements, job function and location of the employee within the worksite, methods of sampling and analysis used, types of respiratory protection in use at the time of sampling, environmental concentrations found, and identification of the exposed employee.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div> <div>5. Environmental monitoring records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = exposure to airborne HG, EGDN, or a mixture of these compounds at a concentration above the action level, or dermal contact with these compounds.</div> <div>2. Ignition and detonation hazard exists.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING</p>	<p>POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Nitroglycerin and Ethylene glycol dinitrate (continued)</p>		<p>might be conducive to skin contact in addition to air sampling, if considered necessary.</p> <p>5. If an employee is found to be exposed to NG or EGDN in excess of the recommended environmental limit, control measures shall be initiated immediately, the exposure of that employee shall be measured at least weekly, and the employee shall be notified of the extent of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental limit. Routine monitoring may then be resumed.</p>	<p>ensure that the employees use the respirators properly when they are required.</p> <p>7. Nonsparking parts, such as those made of bronze, brass, or plastic, shall be used where steel or iron is normally used on any respiratory protective device.</p> <p><b>Hygiene practices</b></p> <p>8. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b>N-Nitrosodimethylamine (1910.1016, 11/78)</b></p>	<ol style="list-style-type: none"> <li>Physical exam, with attn to:               <ol style="list-style-type: none"> <li>Reduced immuno-competence;</li> <li>Steroid or cytotoxic treatment;</li> <li>Pregnancy;</li> <li>Smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including:               <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and all employees considered for assignment to regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Provide upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
N-Nitrosodi- methylamine (1910.1016)		<div>1. A regulated area shall be established where n-nitrosodimethylamine is manufactured, processed, used, repackaged, released, handled, or stored.</div> <div>2. Access shall be restricted to authorized personnel.</div>	<div>Protective clothing</div> <div>1. In operations involving "laboratory-type hoods," or where n-nitrosodimethylamine is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</div> <div>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</div> <div>Respiratory protection</div> <div>3. Employees engaged in n-nitrosodimethylamine handling operations</div>	<div>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</div> <div>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of n-nitrosodimethylamine in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which n-nitrosodimethylamine is present in each regulated area.</div> <div>3. Incidents resulting in release of n-nitrosodimethylamine into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</div> <div>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material</div>	Yes	Yes	Yes	<div>1. Open vessel system operations are prohibited.</div>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>N-Nitrosodi- methylamine (continued)</b>			<p>involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a half-face, filter-type respirator for dusts, mists, and fumes in accordance with 1910.134. A respirator affording higher levels of protection may be substituted.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>released, the amount of time involved, and an explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS.</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Noise (NIOSH 73-11001, 8/72)</p>	<p>1. Baseline audiogram, which includes:</p> <ul style="list-style-type: none"> <li>a. Aural medical history;</li> <li>b. Last exposure to high level noise;</li> <li>c. Number of hours since exposure;</li> <li>d. Type of exposure;</li> <li>e. Noise level, if known.</li> </ul>	<p><b>Within 30 days of assignment, and every 6 yrs</b></p> <ul style="list-style-type: none"> <li>1. Same as in A.</li> </ul> <p><b>Biennially</b></p> <ul style="list-style-type: none"> <li>2. See pp 1-6 and 7 of Reference for specific levels for testing.</li> </ul>	<ul style="list-style-type: none"> <li>1. Retain all audiograms for a period of 20 yrs, as well as all audiometric calibration data.</li> </ul>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>TRAINING</b>	<b>LABELLING POSTING</b>	<b>PRACTICES WORK</b>	<b>ADDITIONAL INFORMATION</b>
<b>Noise</b> (NIOSH 73-11001, 8/72)	<ol style="list-style-type: none"> <li>Occupational exposure shall be controlled so no worker shall be exposed in excess of the limit described as line B in Figure I-1.</li> <li>New installations shall be designed so that noise exposure does not exceed the limits described as line A in Figure I-1.</li> <li>For exposures consisting of two or more periods of exposure at different levels, the Daily Noise Dose, D, shall not be exceeded (use line A or B for computing, as applicable).</li> <li>At no time shall any worker be exposed to</li> </ol>	<ol style="list-style-type: none"> <li>Daily noise exposures shall be determined on the basis of measurements made with a sound level meter conforming as a minimum to the requirement of the American National Standard Specification for Sound Level Meters, S1.4 (1971) Type S2A, and set to use an A-weighted slow response.</li> <li>All measurements shall be made with the sound level meter at a position which most closely approximates the noise levels at the head position of the employee during normal operations.</li> <li>An acoustical calibrator accurate within <math>\pm 1</math> dB shall be used to calibrate the sound level meter on each day that noise measurements are taken.</li> </ol>	<ol style="list-style-type: none"> <li>If noise exposures exceed the limits, ear protectors shall be provided and used in conjunction with an audiometric testing program.</li> <li>Use of personal protective equipment to prevent noise exposure in excess of prescribed limits is authorized only until engineering and administrative controls and procedures can be implemented to maintain the noise exposures within prescribed limits.</li> <li>Any ear protector used by an employee shall reduce the effective noise level to which he/she is exposed so his/her noise exposure is within the permissible limit.</li> <li>Insert-type ear protectors shall be fitted by a person trained in this procedure.</li> <li>Inspection procedures to assure proper issuance, maintenance, and use of personal protective equipment shall be established by the employer.</li> </ol>	<ol style="list-style-type: none"> <li>Maintain environmental exposure monitoring records for a period of 10 yrs.</li> <li>When exposure times of less than 8 hrs/day are required in a specific work area or ear protection is used to meet the exposure limits, records of the method of control shall be maintained.</li> </ol>	Yes	Yes	Yes	

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Noise (continued)	effective noise levels exceeding 115 dBA-Slow.  5. Daily noise dose:  $\frac{C_1}{T_1} + \frac{C_2}{T_2} + \dots + \frac{C_n}{T_n}$  where C <sub>1</sub> , C <sub>2</sub> . . . , C <sub>n</sub> are the actual durations of exposure for an employee at the various noise levels; T <sub>1</sub> , T <sub>2</sub> , . . . , T <sub>n</sub> are the respective duration limits obtained from Figure I-1; and D is the Daily Noise Dose.		6. The employer shall provide training in the proper care and use of all personal protective equipment.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Organotin compounds (NIOSH 77-115, 11/76)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories.</li> <li>Complete physical exam, with attn to: <ol style="list-style-type: none"> <li>14" x 17" post/ant chest X-ray;</li> <li>FVC and FEV1.0;</li> <li>SGOT, SGPT, and any other tests of hepatic function, as DBRP;</li> <li>Eye exam, including tests for: <ol style="list-style-type: none"> <li>Visual acuity;</li> <li>Color vision;</li> <li>Pupillary reactions;</li> <li>Glaucoma;</li> <li>Possibility of choked disc;</li> </ol> </li> <li>ECG (for ≥40 yrs old);</li> <li>Prior history of increased intracranial pressure;</li> <li>If spinal fluid is measured, then perform Queckenstedt maneuver;</li> <li>Urinalysis.</li> </ol> </li> <li>Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>Same as in A.1 and 2, with the exception of neurologic exam, as DBRP.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 5 yrs after termination of employment for all employees exposed.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>Appropriate medical services.</li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>Examination to determine need for treatment, with attn to: <ol style="list-style-type: none"> <li>Eyes;</li> <li>Lungs.</li> </ol> </li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Organotin compounds (NIOSH 77-115, 11/76)	1. TWA: 0.1.  2. Environmental samples shall be collected and analyzed as described in Appendices I and II, or by any methods shown to be at least equivalent in accuracy, precision, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b>  1. Employers shall conduct an IH survey at locations where organotins are released into workplace air to determine whether exposure to airborne concentrations of organotin is in excess of the action level.  2. Surveys shall be repeated at least annually and within 30 days of any process change likely to result in an increase of airborne organotin concentrations.  <b>Personal monitoring</b>  3. If it has been determined that the environmental concentration of organotins might exceed the action level, the employer shall institute a program of personal monitoring to identify and measure the exposure of each employee occupationally exposed to organotins.  4. Source and area monitoring may be used to supplement personal monitoring.  5. If an employee is found to be exposed above the	<b>Protective clothing</b>  1. The employer shall provide protective clothing impervious to organotins to prevent skin and eye contact.  2. The employer shall provide appropriate impervious clothing, including gloves, aprons, suits, boots, or face shield (8 in minimum) and goggles and shall ensure that employees wear protective clothing where needed to prevent skin contact.  <b>Eye protection</b>  3. The employer shall provide chemical safety goggles or face shields and goggles and shall ensure that employees wear the protective equipment during any operation in which organotins may enter the eyes.  <b>Respiratory protection</b>  4. Respiratory protective equipment shall be used during the time necessary to install or test the required engineering controls; for operations such as maintenance and	1. IH survey records shall be maintained.  2. Employers or their successors shall keep records of environmental monitoring for each employee for at least 5 yrs after the individual's employment has ended.  3. These records shall include the name and SSN of the employee being monitored, duties and job locations within the work site, dates of measurements, sampling and analytical methods used and evidence for their accuracy, duration of sampling, number of samples taken, results of analyses, TWA concentrations based on these samples, and any personal protective equipment in use by the employee.  4. Records for each employee, indicating date of employment with the company and changes in job assignment, shall be kept for the same 5-yr duration.  5. The employer shall make these records available upon request to DR of the	Yes	Yes	Yes	1. Organotin = the group of compounds having at least 1 covalent bond between carbon and tin.  2. Occupational exposure = exposure to organotin compounds at concentrations in excess of the action level.  3. Action level = 1/2 the TWA.	



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN - SOCIAL SECURITY NUMBER  
DMR - DESIGNATED MEDICAL REPRESENTATIVE  
HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Organotin compounds (continued)</b>		<p>action level, the exposure of that employee shall be monitored at least once every 3 mos.</p> <p>6. If an employee is found to be overexposed, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental concentration limit; quarterly monitoring may then be resumed.</p> <p>7. The employee or DR shall be given the opportunity to observe any measurement conducted in accordance with this section.</p>	<p>repair activities causing brief exposure at concentrations in excess of the TWA concentration limit; during emergencies when concentrations of airborne organotins might exceed the TWA concentration limit; and when engineering controls are not feasible to maintain atmospheric concentrations below the TWA concentration limit.</p> <p>5. The employer shall provide respirators in accordance with Table I-1 and shall ensure that employees use the respirators provided.</p> <p>6. When a self-contained breathing apparatus is permitted in accordance with Table I-1, it shall be used pursuant to the following requirements:</p> <p>a. The employer shall provide initial training and refresher courses on the use, maintenance, and function of self-contained breathing apparatus;</p> <p>b. If the self-contained breathing apparatus is operated in the</p>	<p>Assistant Sec. of Labor for OSHA or of the Director of NIOSH.</p> <p>6. Employees or DR shall have access to information on their own exposures.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Organotin compounds (continued)</b>			<p>negative-demand mode, a supervisor shall check employees and ensure that the respirators have been properly adjusted prior to use;</p> <p>c. Whenever a self-contained breathing apparatus is supplied for escape purposes, the respirator shall be operated in the pressure-demand mode.</p> <p>7. Emergency equipment shall be located at clearly identified stations within the work area and shall be adequate to permit all employees to escape safely from the area. Protective equipment suitable for emergency use shall be located at clearly identified stations outside the work area.</p> <p><b>Hygiene practices</b></p> <p>8. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Oxides of nitrogen (NIOSH 76-149, 3/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Pulmonary function tests:               <ol style="list-style-type: none"> <li>a. Auscultation of chest;</li> <li>b. FVC and FEV1.0.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> <li>4. 14" x 17" post/ant chest X-ray.</li> <li>5. Other pulmonary function evaluations:               <ol style="list-style-type: none"> <li>a. Pulmonary compliance and diffusion studies.</li> </ol> </li> </ol>	<b>Annually</b> 1. Same as in A, except A.4.	<ol style="list-style-type: none"> <li>1. Retain records and X-rays 20 yrs after termination of employment for all persons involved in work involving exposure.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G  P O S T I N G</p>	<p>P R A C T I C E S  W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p>Oxides of nitrogen (NIOSH 76-149, 3/76)</p>	<ol style="list-style-type: none"> <li>1. Ceiling limit for 15 min for nitrogen dioxide (NO<sub>2</sub>): 1.8 (1).</li> <li>2. TWA for nitrogen oxide: 30 (25).</li> <li>3. Since nitrogen dioxide rarely exists independent of nitric oxide in the workplace air, a sufficient number of samples shall be taken to determine a ceiling concentration for nitrogen dioxide and a TWA for nitric oxide in order to characterize the worker's exposure to the oxides of nitrogen.</li> <li>4. Procedures for collection and analysis of environmental samples shall be as provided</li> </ol>	<ol style="list-style-type: none"> <li>1. Workers employed in areas where oxides of nitrogen are manufactured, stored, transported, handled, or produced as byproducts of work operations shall not be considered as occupationally exposed to oxides of nitrogen if it has been determined, on the basis of an IH survey carried out by the employer or the judgment of a compliance officer, that workers are not exposed to oxides of nitrogen greater than 1/2 of the 1-ppm ceiling limit of nitrogen dioxide or 1/2 of the 25-ppm TWA limit of nitric oxide.</li> <li>2. An IH survey of the work area shall be made when equipment changes, process modifications, or worksite changes may reasonably be expected to increase the concentrations of the oxides of nitrogen above the levels defining occupational exposure.</li> <li>3. If, from the results of an IH survey or the judgment of a compliance officer, there is occupational exposure to oxides of nitrogen, the employer</li> </ol>	<p><b>Eye protection</b></p> <ol style="list-style-type: none"> <li>1. Cup-type or rubber-framed goggles, equipped with approved impact-resistant glass or plastic lenses, shall be worn whenever there is <i>danger of eye contact</i>, such as working with pipelines, valves, etc., which might leak and spurt liquid nitrogen dioxide or nitric oxide.</li> <li>2. Metal- or plastic-rim safety spectacles with unperforated side shields, or suitable all-plastic safety goggles may be used where continuous eye protection is desirable.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. When permissible, the employer shall provide employees with respirators in accordance with Table I-1 and shall ensure that employees use the respirators in a proper manner.</li> <li>5. Wherever bulk nitrogen dioxide or nitric oxide is stored or is introduced into an operation or process from a source under pressure, the employer shall store emergency and escape-type respirators</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be retained for at least 20 yrs after termination of an individual worker's employment.</li> <li>2. The employer shall keep records of all environmental monitoring of oxides of nitrogen. The records shall include not only the determined concentrations of oxides of nitrogen but also shall include a description of monitoring and analytical methods. In addition, the records shall include a listing of the type of respirator and other personal protective equipment, if any, worn by employees.</li> <li>3. The monitoring records shall identify the employees for whom breathing zone air samples were collected.</li> <li>4. The employer shall make such records available to DR of the Sec. of HHS, of the Sec. of Labor, and to the employee or former employee.</li> <li>5. The employer shall keep the records of all environmental monitoring of the</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to oxides of nitrogen at concentrations equal to or above 1/2 the PELs.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Oxides of nitrogen (continued)</p>	<p>for in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.</p>	<p>shall monitor the environ- mental concentrations of the oxides of nitrogen at least semiannually, except as indicated by a PIH.</p> <p>4. Environmental monitoring of the workplace shall be carried out by the employer within 30 days after installation of a new process or within 30 days after equipment changes, process modifications, or worksite changes.</p> <p>5. If the measurements of the environmental con- centrations of oxides of nitrogen in a work area indicate that the levels of either nitrogen dioxide or nitric oxide exceed the prescribed limits, the employer shall install appropriate engineering controls and shall monitor the environmental concentrations of oxides of nitrogen in the work area at intervals of 15 days until the results of at least 2 consecutive monitorings have demonstrated that the environmental concen- trations of oxides of nitrogen are below the prescribed limits.</p>	<p>so that they are readily accessible to each employee.</p> <p>6. The employer shall assign an employee to a job which requires the wearing of a respirator for protection against oxides of nitrogen only with a medical evaluation of the employee's physical ability to safely perform his or her duties while wearing a respirator.</p> <p>7. The employer shall periodically monitor the use of respirators to ensure that the proper type of respirator is being worn in a satisfactory manner.</p> <p>8. The employer shall periodically evaluate the effectiveness of the respiratory protection program and eliminate any deficiencies.</p>	<p>levels of oxides of nitrogen for each employee for whom breathing zone air samples were collected for at least 20 yrs after the employee's employment is terminated.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Oxides of nitrogen (continued)		<p>6. The minimum number of representative ceiling determinations for nitrogen dioxide and TWA exposure determinations for nitric oxide for an operation or process shall be based on variations in exposures and production schedules, considering the number of workers exposed as suggested in the table below or as indicated by a PIH.</p> <table><tr><th>Number of Employees Exposed to Oxides of Nitrogen</th><th>Minimum Number of Air Samples to be Collected and Analyzed</th></tr><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 30 workers</td></tr><tr><td>&gt;100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table>	Number of Employees Exposed to Oxides of Nitrogen	Minimum Number of Air Samples to be Collected and Analyzed	1-20	50% of the total number of workers	21-100	10 plus 25% of the excess over 30 workers	>100	30 plus 5% of the excess over 100 workers							
Number of Employees Exposed to Oxides of Nitrogen	Minimum Number of Air Samples to be Collected and Analyzed																
1-20	50% of the total number of workers																
21-100	10 plus 25% of the excess over 30 workers																
>100	30 plus 5% of the excess over 100 workers																

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Parathion (NIOSH 76-190, 6/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, to exclude from assignment those with histories of: <ol style="list-style-type: none"> <li>a. Glaucoma;</li> <li>b. Cardiovascular disease;</li> <li>c. Hepatic disease;</li> <li>d. Renal disease;</li> <li>e. CNS abnormalities.</li> </ol> </li> <li>2. Physical exam, emphasizing: <ol style="list-style-type: none"> <li>a. Headache, dizziness, nausea, tightness of chest, dimness of vision, difficulty in focusing eyes.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol> <p><b>Biological monitoring</b></p> <ol style="list-style-type: none"> <li>2. Employees who are to be occupationally exposed to the substance shall have two preexposure erythrocyte ChE baseline determinations, at least 1 day apart, after a period of 60 days has elapsed without known exposure to parathion. Those whose work histories preclude preexposure determinations shall have working baselines performed.</li> <li>3. Within 60 days of promulgation of a standard, all present employees exposed to parathion shall have working baseline erythrocyte ChE activity determined.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> <li>3. Retain records on preexposure baseline erythrocyte ChE activity or working baseline ChE activity and all ChE activities measured during employment.</li> </ol>	<ol style="list-style-type: none"> <li>1. In the event of associated illness: <ol style="list-style-type: none"> <li>a. Appropriate medical services.</li> </ol> </li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>2. First aid.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b>  <b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b> <b>W O R K</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><b>Parathion (NIOSH 76-190, 6/76)</b></p>	<ol style="list-style-type: none"> <li>1. TWA: 0.05.</li> <li>2. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any method shown to be at least equivalent in accuracy, precision, and sensitivity to those specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Each employer involved in the manufacture or formulation of parathion shall monitor environmental air levels of parathion at least monthly, except as specified otherwise by a PIH.</li> <li>2. If monitoring of an employee's exposure to parathion reveals that he or she is exposed at concentrations in excess of the recommended TWA environmental limit, control measures shall be initiated and the employee shall be notified of his or her exposure and of the control measures being implemented to correct this situation. Monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that employee exposure no longer exceeds the TWA environmental limit. Monthly monitoring may then be resumed.</li> <li>3. Where filter-air enclosures are used, air levels of parathion shall be regularly monitored to ensure compliance with the standard.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Any employee who engages in filling, pouring, mixing, formulating, loading, applying, or otherwise handling parathion (including in open-system manufacturing processes) shall be provided with, and required to wear, protective head covering; goggles or face shield; impervious gloves; full-body coveralls, impervious apron, or impervious rainsuit; and impervious footwear.</li> <li>2. Impervious gloves should have reverse gauntlets and coveralls should be of a closely woven material (siliconized fabric [nylon or cotton] is especially protective) without cuffs.</li> <li>3. Employees handling sealed, nonleaking containers of parathion shall be provided with, and required to wear, full-body coveralls and impervious gloves.</li> <li>4. Employees operating open equipment for ground (non-aerial)</li> </ol>	<ol style="list-style-type: none"> <li>1. Sampling records shall be maintained so that exposure information is available for individual employees.</li> <li>2. These records shall indicate the results of air sampling; the type of personal protective device, if any, in use by each employee at the time of sampling; and sampling and analytical methods.</li> <li>3. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>4. Records required by this section shall be maintained for 5 yrs after the worker's employment has ended.</li> <li>5. Shall be made available to the DR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee or former employee.</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = employment in any area in which parathion or materials containing parathion, alone or in combination with other substances, is produced, packaged, processed, mixed, blended, handled, stored in large quantities, or applied.</li> <li>2. Greatest danger to employee exposed is from skin contact.</li> </ol>

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Parathion (continued)		4. Subsequent to determi- nation of a preexposure or working baseline, each employee occu- pationally exposed to parathion shall have his erythrocyte ChE determined at 4-wk intervals, except for: mixers, loaders, ground applicators, flaggers, and manufacturing or formulating employees working with other than closed production, mixing, blending, trans- fer and packaging systems—all of whom shall be tested at 1-wk intervals. This 1-wk interval is reduced to 3 days if an employee works with parathion for >12 hrs during any workday. This continues until 1 work- week has elapsed without a workday exceeding 12 hrs. Employees who clean		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> <b>mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Parathion (continued)</b>			<p>application of parathion shall be provided with, and required to wear, a protective head covering, preferably wide-brimmed and waterproof, or face shield, impervious gloves, full-body coveralls or an impervious rainsuit, and impervious footwear.</p> <p>5. Employees applying parathion by closed-cockpit aircraft shall be provided with impervious gloves. Employees applying parathion by open-cockpit aircraft shall be provided with, and required to wear, full-body coveralls or impervious rainsuit, goggles, and impervious gloves.</p> <p>6. Employees acting as flaggers (other than those flagging from enclosures) in the aerial application of parathion shall be provided with, and required to wear, full-body coveralls or impervious rainsuit, a protective head and neck covering (preferably wide-brimmed and</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Parathion (continued)		or repair equipment, clean spills, and aerial applicators not engaged in loading operations shall be tested at 2-wk intervals.  5. When enzymic activity of erythrocyte ChE is decreased to between 60 and 70% of the employee's preexposure baseline or working baseline level, the worker shall be advised of this finding and an industrial hygiene survey conducted. This includes assessment of the dermal exposure potential. Corrective action shall be taken. Said worker shall be removed from exposure and placed under medical observation.  6. A removed worker shall not be allowed to return to work involving parathion		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Parathion (continued)</b>			<p>waterproof), impervious footwear, and impervious gloves.</p> <p>7. Where toxic residues present a reasonable potential for exposure, employees entering areas treated with parathion shall be provided with, and required to wear, impervious gloves, full-body coveralls or impervious rainsuit, face shield if foliage is likely to contact the face, and impervious footwear.</p> <p>8. Employees (such as cleanup personnel) entering areas contaminated with parathion shall be provided with, and required to wear, impervious gloves, full-body coveralls or impervious rainsuits, impervious footwear, impervious apron, and such other personal protective equipment as may be required for adequate protection against the particular hazards presented.</p> <p>9. Laundry personnel handling clothing contaminated with</p>						



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Parathion (continued)		<p>exposure until his erythrocyte ChE activity has returned to 75% of the working/preexposure value or a physician has approved his return.</p> <p>7. Each employee shall be given a copy of the results of his initial and periodic tests, and any other results as soon as possible, plus an interpretation.</p>		

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Parathion (continued)</b>			<p>parathion shall be provided with, and required to wear, impervious gauntlet gloves, impervious shoes, and, in addition to ordinary clothes, an impervious apron.</p> <p>10. The employer shall ensure that all personal protective devices are inspected regularly and maintained in clean and satisfactory working condition.</p> <p>11. Protective clothing shall not be taken home by employees. The employer shall provide for maintenance and laundering of protective clothing.</p> <p><b>Respiratory protection</b></p> <p>12. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>13. Employees experiencing breathing difficulties while wearing respiratory protective devices shall be medically examined to</p>						

# **MEDICAL SURVEILLANCE**

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S</p>	<p>ADDITIONAL INFORMATION</p>
<p>Parathion (continued)</p>			<p>determine their ability to wear such devices. If it is determined that an employee cannot breathe adequately while wearing a respirator, the employee shall not be allowed to work in any operation requiring the use of a respirator.</p> <p>14. Canisters or cartridges shall be discarded and replaced with fresh canisters or cartridges in accord with the manufacturer's specifications; or if the odor of parathion, parathion-containing formulations, dilutents, emulsifiers, or solvents is detected while using the respirator; or if a breakthrough-indicator (if any) indicates the absorbent is saturated, whichever occurs first. Filters shall be changed whenever canisters or cartridges are changed, or after every 4 hrs of use, or if breathing becomes difficult, whichever occurs first. Unused canisters or cartridges shall be discarded and replaced when the seals are broken, or on the</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> BOLD TYPE FOR OSHA STANDARDS</p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Parathion (continued)</p>			<p>expiration of the manufacturer's recommended storage life if the seals are unbroken.</p> <p>15. Respirators, except cooled supplied-air type, shall not be used for more than 15 min if ambient temperature exceeds 85°F in the particular workplace except in emergencies.</p> <p>16. Where an emergency may develop which could result in overexposure of employees to parathion, the employer shall provide respiratory protection as indicated in Table I-1.</p> <p>17. The application of parathion formulations is not to be considered a nonroutine operation for which respirators may be used in exposure situations where the environmental limit is exceeded.</p> <p><b>Hygiene practices</b></p> <p>18. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Pesticides (manufacture and formulation of) (NIOSH 78-174, 7/78)</p>	<ol style="list-style-type: none"> <li>For those exposed to Groups III, II, and I pesticides (see Reference).</li> <li>Comprehensive work and medical histories, with emphasis on:               <ol style="list-style-type: none"> <li>Hepatic system;</li> <li>Renal system;</li> <li>Central nervous system;</li> <li>Glaucoma;</li> <li>Cardiovascular disease;</li> <li>Respiratory disease;</li> <li>Use of drugs;</li> <li>Any illness resulting from past exposures.</li> </ol> </li> <li>Comprehensive physical exam, with attn to:               <ol style="list-style-type: none"> <li>Eyes;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Lungs;</li> <li>Central and peripheral nervous system.</li> </ol> </li> <li>As DBRP:               <ol style="list-style-type: none"> <li>Chest X-ray;</li> <li>Liver enzyme determination;</li> <li>Urinalysis;</li> <li>Pulmonary function.</li> </ol> </li> <li>Ability to use negative and positive pressure respirators.</li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.2 and 3 (see p. 8 of Reference for timing).</li> <li>For those exposed to organic phosphorus.</li> <li>RBC ChE activity determination, with method described in Appendix II of Reference or equivalent.</li> <li>If RBC ChE &lt;70% of baseline:               <ol style="list-style-type: none"> <li>Advise employee of finding;</li> <li>Industrial hygiene survey, unless cause known and correction begun.</li> </ol> </li> <li>If RBC ChE &lt;60% of baseline:               <ol style="list-style-type: none"> <li>Remove employee from potential exposure and place under medical observation.</li> <li>Not allowed back to work with pesticide exposure until RBC ChE ≥75% of baseline.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Retain examination and emergency treatment records 30 yrs after termination of employment for all employees subject to exposure.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>Appropriate medical services and surveillance.</li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>First aid under the direction of responsible physician.</li> </ol> <p><b>Within 1 mo after termination of employment</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Pesticides (manufacture and fomulation of) (NIOSH 78-174, 7/78)	1. Varies with each specific pesticide.	Groups III, II, and I  1. Employers shall conduct a survey of the plant to determine:  a. The names and approximate quantities of all pesticides used or stored in the plant;  b. Places where pesticides might escape from containers or equip-ment and the expected distribution of pesticide contamination in the event of such escape;  c. All locations and operations in which employees may be exposed to pesticides and the nature of their potential exposure. Airborne concen-trations of pesticides to which workers are exposed shall be measured;  d. The movement and location of pesticides in plant processes and storage.  2. The survey shall be repeated at least annually.	Work clothing  Group III  1. Employers shall provide a means for storing contaminated work clothing in a location separate from street clothing to prevent contamination of street clothing.  Groups II and I  2. All employees working in potential exposure areas shall be required to wear the following:  a. Washable socks and underwear;  b. Washable or disposable coveralls or pants and long-sleeved shirts, aprons, or other special outerwear;  c. Washable work footwear or disposable footwear covers;  d. Washable cap, if a hard hat is not required.  3. Employees shall be required to wear a clean set of work clothing each day. A complete second set of clean work	Groups III, II, and I  1. Survey data and documentation of overexposure of any employee to pesticides or any other chemical in the workplace shall be maintained for at least 30 yrs after termination of employment of the employee.  2. All records shall be stored and accessible in a manner that permits comparison between medical records and exposure data.	Yes	Yes	Yes		



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Pesticides (manufacture and formulation of) (continued)</b>	6. If exposed or to be exposed to cholinesterase inhibitors (in Appendix I of Reference), determination of working or pre- exposure baseline for RBC ChE activity (see p. 7 of Reference for further elaboration).			

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Pesticides (manufacture and formulation of) (continued)</b>			<p>clothing shall be provided and used to replace any that become obviously contaminated during the workshift.</p> <p>4. Employers shall provide a means for storing contaminated work clothing from the time it is removed by employees until its disposal or laundering. This means shall:</p> <ul style="list-style-type: none"> <li>a. Clearly identify the nature of contamination;</li> <li>b. Prevent the contamination from being disseminated.</li> </ul> <p>5. Employers shall also provide a means for the disposal or laundering of all contaminated garments. All persons engaged in laundering such garments shall be instructed as to the pesticide hazard. For garments worn while handling carbamates or OPs, laundering shall include presoaking in an alkaline solution (preferably of pH 10 or greater), washing, and subsequent rinsing.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Pesticides (manufacture and formulation of) (continued)			<p>Garments laundered by other than the employer shall be reused only by the employer.</p> <p><b>Personal protective equipment</b> <b>Group III</b></p> <p>6. Employees who may be exposed to pesticides in a dust or powdered form shall wear, in addition to their set of work clothing:</p> <p>a. Washable gloves.</p> <p>7. Employees who may be exposed to pesticides in a liquid or in a wet or hygroscopic solid form shall wear, in addition to their set of work clothing, the following:</p> <p>a. Chemical goggles, and where chemical burns are a hazard, a face shield;</p> <p>b. Gloves made of minimally permeable material;</p> <p>c. Footwear or footwear covers made of minimally permeable material;</p> <p>d. An apron or similar body covering made of minimally</p>					

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Pesticides (manufacture and formulation of) (continued)</p>			<p>permeable material to prevent contamination of clothing;</p> <p>e. A type of hat whose configuration prevents spilled liquids from dripping on the neck or into the face of the wearer.</p> <p>8. All personal protective equipment shall be inspected at least quarterly by the employer to check for contamination, deterioration, or loss of function and shall be replaced if necessary.</p> <p><b>Group II</b></p> <p>Group III requirements for Personal Protective Equipment apply with the following additions and changes:</p> <p>9. Inspection frequency shall be at least monthly.</p> <p>10. Personal protective equipment shall be cleaned or replaced each time it is used. Extra issues of clean protective equipment shall be provided and used to</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G / P O S T I N G</b>	<b>P R A C T I C E S / W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Pesticides (manufacture and formulation of) (continued)</b>			<p>replace any which become obviously contaminated during the workshift.</p> <p>11. Employers shall make appropriate provisions for the washing of personal protective equipment, including:</p> <ul style="list-style-type: none"> <li>a. Sink with running water;</li> <li>b. Decontamination solution to remove or neutralize pesticides;</li> <li>c. Disinfectant or sanitizing rinse;</li> <li>d. Drying rack or disposable towels.</li> </ul> <p><b>Group I</b></p> <p>Group II requirements for Personal Protective Equipment apply with the following changes:</p> <p>12. Inspection frequency shall be at least weekly.</p> <p>13. Employers shall be responsible for decontamination, sterilization, and maintenance of protective equipment.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b> <b>P O S T I N G</b></p>	<p><b>P R A C T I C E S W O R K</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p><i>Pesticides (manufacture and formulation of)</i> (continued)</p>			<p><b>Respiratory protection</b> <b>Groups III and II</b></p> <p>14. Protection of employees from exposure to airborne pesticides may not be achieved by the use of respirators except:</p> <ul style="list-style-type: none"> <li>a. During the development, installation, testing, maintenance, or repair of required engineering controls;</li> <li>b. For conducting operations such as maintenance, repair, or cleanup of spills;</li> <li>c. During emergencies.</li> </ul> <p>15. Employers shall use exposure data to determine which locations and employees shall be provided with emergency-use respirators.</p> <p>16. Employers shall prepare written procedures for use of respirators. The procedures for each type of respirator shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> <li>a. By whom and where the respirator is to be worn;</li> </ul>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G P O S T I N G</b>	<b>P R A C T I C E S W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Pesticides (manufacture and formulation of) (continued)</b>			<ul style="list-style-type: none"> <li>b. Limits as to materials and concentrations against which the respirator affords protection;</li> <li>c. Manner in which the respirator is to be put on, worn, and taken off;</li> <li>d. Frequency of servicing, disinfecting, cleaning, inspecting, and replacing parts of the respirator;</li> <li>e. Manner and location of respirator storage.</li> <li>17. Employers shall maintain a written log for all nondisposable respirators which includes:               <ul style="list-style-type: none"> <li>a. Date of purchase; shelf-life information;</li> <li>b. Dates of issue, wearing and servicing, suitable identification of persons responsible for these actions;</li> <li>c. Dates and conditions of tests and inspections.</li> </ul> </li> <li>18. Employers shall supervise the respiratory protective program according to the following schedule:               <ul style="list-style-type: none"> <li>a. Observe at least monthly each</li> </ul> </li> </ul>					

## MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

**OBRP - DETERMINED BY RESPONSIBLE PHYSICIAN**  
**SSAN - SOCIAL SECURITY NUMBER**  
**DMR - DESIGNATED MEDICAL REPRESENTATIVE**  
**HHS - HEALTH AND HUMAN SERVICES**

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p>Pesticides (manufacture and formulation of) (continued)</p>			<p>employee wearing a non-emergency-use respirator while he/she is performing work tasks;</p> <p>b. Inspect each non-emergency-use respirator at least monthly;</p> <p>c. Inspect and test each emergency-use respirator at least monthly and after each use;</p> <p>d. Conduct a practice drill at least quarterly with each employee who would wear emergency-use respirators.</p> <p><b>Group I</b></p> <p>Group II requirements for Respiratory Protection apply with the following additions and changes:</p> <p>19. 18(a) and (b) inspection frequencies shall be at least weekly.</p> <p>20. Except for emergency-escape-use respirators, all respirators shall be a full-face, air-supplied or self-contained type, unless respirators of other types are certified under 30 CFR 11.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Pesticides (manufacture and formulation of)</b> <b>(continued)</b>			21. Quantitative fit tests shall be administered to all employees who may be required to wear respirators.  <b>Hygiene practices</b>  22. Sanitation measures specified for all groups.						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Petroleum solvents (refined) (NIOSH 77-192, 7/77)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories.</li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Liver function tests (e.g., SGOT);</li> <li>c. Complete blood count;</li> <li>d. Urinalysis;</li> <li>e. CNS tests.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 30 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>In an emergency</b> <ol style="list-style-type: none"> <li>1. First aid, followed by prompt medical evaluation and care.</li> <li>2. Observation for possibility of CNS depression.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Petroleum solvents (refined) (NIOSH 77-192, 7/77)	<div>1. TWA for all petroleum solvents except kerosene: 350.</div> <div>2. Ceiling limit for all petroleum solvents except kerosene for 15 min: 1,800.</div> <div>3. TWA for kerosene: 100.</div> <div>4. Procedures for the collection and analysis of workroom air samples shall be as provided in Appendices II, III, and IV, or by any methods shown to be at least equivalent in precision and sensitivity to the methods specified.</div>	<div>Industrial hygiene survey</div> <div>1. Workers are not considered to have occupational exposure to refined petroleum solvents if environmental concentrations as determined on the basis of an IH survey do not exceed the action level.</div> <div>2. Surveys shall be repeated at least once a yr and within 30 days after any process change likely to result in increases of airborne refined petroleum solvent concentrations.</div> <div>Personal monitoring</div> <div>3. If there is occupational exposure to refined petroleum solvents, a program of personal monitoring shall be instituted to identify and measure the exposures of all employees who are occupationally exposed.</div> <div>4. Monitoring of employee exposures to airborne refined petroleum solvents shall be conducted at least every 6 mos.</div> <div>5. If monitoring of an employee's exposure to a refined petroleum solvent</div>	<div>Protective clothing</div> <div>1. Appropriate protective clothing, including gloves, aprons, suits, boots, and face shields (8 in minimum) with goggles, made of a material resistant to refined petroleum solvents shall be provided for and worn by every employee to limit skin contact.</div> <div>2. In addition, the protective clothing shall also be fire-resistant.</div> <div>3. This type of clothing shall be worn by employees removing clothing from dry-cleaning machines or performing spotting operations.</div> <div>4. In addition to being solvent-resistant, the gloves used in these operations shall also be of sufficient length to protect the forearms of the employees.</div> <div>5. Unless protective clothing is being worn, the employer shall ensure that a change of clothing is immediately available to and used by any</div>	<div>1. IH survey records shall be maintained.</div> <div>2. Records of environmental monitoring shall be kept by the employer for at least 30 yrs.</div> <div>3. These records shall include the dates of measurements; job function and location of the employees at the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; TWA and ceiling concentrations estimated from these samples; type of personal protective equipment used; and exposed employees' names.</div> <div>4. Each employee shall have access to information on his or her own environmental exposures.</div> <div>5. Environmental records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</div>	Yes	Yes	Yes	<div>1. Refined petroleum solvents = petroleum ether, rubber solvent, varnish makers' and painters' naphtha, mineral spirits, stoddard solvents, and kerosene.</div> <div>2. Action level for petroleum ether, rubber solvent, and varnish makers' and painters' naphtha = TWA of 200 mg/cu m.</div> <div>3. Action level for mineral spirits and stoddard solvent = TWA of 350 mg/cu m.</div> <div>4. Action level for kerosene = TWA of 100 mg/cu m.</div> <div>5. Occupational exposure = exposure to petroleum solvents above the action level.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G P O S T I N G</p>	<p>P R A C T I C E S W O R K</p>	<p>ADDITIONAL INFORMATION</p>
<p>Petroleum solvents (refined) (continued)</p>		<p>reveals that this employee is exposed at concentrations in excess of the appropriate environmental limit(s), control measures shall be initiated, the employee shall be notified of the exposure and of the control measures being implemented to correct the situation, and the exposure of that employee shall be monitored at least once every 30 days. Such monitoring shall continue until 2 consecutive samplings, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the environmental limits. Semiannual monitoring may then be resumed.</p>	<p>employee whose clothes become wetted with solvents.</p> <p>6. Where protective clothing is required, the employer shall provide the employee with separate storage facilities for work clothes and for street clothes, preferably separated by shower facilities.</p> <p>7. Safety showers and eyewash fountains shall be provided in appropriate areas. These showers and fountains shall be checked periodically to ensure their proper working condition.</p> <p><b>Eye protection</b></p> <p>8. Chemical safety goggles (splash-proof) and face shields (8 in minimum) shall be provided and worn in any operation in which there is reasonable probability of a solvent being splashed into the eyes.</p> <p><b>Respiratory protection</b></p> <p>9. When permissible, the employer shall provide respirators in accordance with Tables I-1, I-2, and</p>					

# MEDICAL SURVEILLANCE


<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Petroleum solvents (refined) (continued)			<p>1-3 depending on the type of solvent used and shall ensure that the employee uses the appropriate respirator when needed.</p> <p>10. Respirators shall be easily accessible in work areas and employees shall be informed of their location.</p> <p>Hygiene practices</p> <p>11. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Phenol (NIOSH 76-196, 6/76)	<ol style="list-style-type: none"> <li>Comprehensive medical history, with at least the pre-existing disorders of:               <ol style="list-style-type: none"> <li>Skin;</li> <li>Respiratory tract;</li> <li>Liver;</li> <li>Kidneys.</li> </ol> </li> <li>Physical exam, with at least:               <ol style="list-style-type: none"> <li>Cardiovascular system;</li> <li>Respiratory tract;</li> <li>Liver;</li> <li>Kidneys;</li> <li>Skin; </li> <li>Blood test;</li> <li>Urine exam;</li> <li>Other tests, as DBRP.</li> </ol> </li> <li>Ability to use negative or positive pressure respirator.</li> </ol>	<b>As DBRP</b> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 1 yr after termination of employment for all employees exposed.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If adverse health effects seen</b> <ol style="list-style-type: none"> <li>Appropriate medical services and surveillance.</li> </ol> <b>In an emergency</b> <ol style="list-style-type: none"> <li>Prompt first aid.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
Phenol (NIOSH 76-196, 6/76)	1. TWA: 20. 2. Ceiling limit for 15 min: 60. 3. Procedures for calibration of equipment, sampling, and analysis of phenol samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.	1. Workplace areas are not considered to have occupational exposure to phenol if airborne concentrations of phenol as determined on the basis of an IH survey do not exceed 10 mg/cu m. 2. If occupational exposure occurs, an adequate number of samples representative of the exposure in the breathing zone of the employees shall be collected to permit calculation of a TWA concentration exposure for a representative group of employees in every work operation involving phenol. 3. This shall be performed quarterly for a minimum period of 1 yr until it is verified that occupational exposure has not occurred. Thereafter, monitoring shall be performed annually unless there are changes in the production or process. When this occurs, monitoring shall again be conducted to determine each employee's exposure to phenol. 4. Workplace environmental samples shall be taken within 30 days after	<b>Protective clothing</b> 1. Protective clothing impervious to phenol shall be provided to prevent contact of phenol with the body surface. 2. Employers shall provide protective equipment and clothing to employees when airborne phenol exceeds the TWA. 3. Employers shall provide, and employees shall be required to wear, gloves of neoprene, polyethylene, rubber, or other material impervious to phenol when working with phenol. 4. Employers shall provide, and employees shall be required to wear, protective sleeves, aprons, jackets, trousers, caps, and shoes when needed for protection from skin contact with phenol. These garments shall be made of a material impervious to phenol. 5. In emergencies or other circumstances involving exposure to airborne phenol at concentrations in excess of 20 mg/cu m,	1. IH survey records shall be maintained. 2. Records of all sampling and analyses for phenol shall be maintained for at least 1 yr. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling. Records shall be maintained so that the exposure of each employee can be classified or characterized. 3. All records shall be made available upon request to DR of the Assistant Sec. of Labor for OSHA or of the Director of NIOSH. 4. An employee's exposure determination and exposure measurement records shall be made available to the employee or his DR upon request by the employee to the employer.	Yes	Yes	Yes	1. Occupational exposure = exposure to phenol at airborne concentrations exceeding 1/2 the PEL.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Phenol (continued)</b>		<p>installation of a new process or process change.</p> <p>5. Should environmental sampling indicate airborne phenol concentrations between 10 mg/cu m and 20 mg/cu m, samples shall be collected in accordance with Appendix I and analyzed in accordance with Appendix II, or by equivalent or better methods.</p> <p>6. For work areas in which the phenol concentration exceeds 20 mg/cu m, corrective measures shall be initiated and monitoring shall be repeated on a weekly basis until 2 consecutive sampling periods have shown that airborne phenol concentrations have been reduced to 20 mg/cu m or below.</p>	<p>full-body protective clothing shall be worn in addition to a respiratory protective device. The garments shall be of an impervious material and shall fit snugly about the wrists, neck, waist, and ankles.</p> <p>6. Employees handling drums, cans, or other containers of phenol shall wear impervious shoes or boots with safety toe-caps. Leather safety shoes shall be protected from splashes or spills by use of impervious coverings such as rubbers.</p> <p>7. In unusual, nonroutine, or emergency circumstances which may involve occasional periods of exposure to airborne phenol at concentrations in excess of 20 mg/cu m, clothing impervious to phenol vapor and aerosol shall be supplied by employers and shall be worn to supplement the required respiratory protection.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Phenol (continued)</b>			<b>Eye protection</b>  8. Cup-type or rubber-framed chemical safety goggles shall be worn by employees engaged in activities wherein it is likely that phenol may come in contact with the eye. With airborne phenol at concentrations in excess of 20 mg/cu m, a full-face mask respiratory protective device is required which will also provide adequate eye protection.  9. Full-length, plastic face shields shall be worn in addition to safety goggles for face protection when working at tasks where contact with phenol is likely.  <b>Respiratory protection</b> 10. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator properly.  11. Use of chemical cartridges and canisters more than once or for a						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Phenol (continued)			<p>period of time greater than that indicated in Table 1-1 shall be prohibited.</p> <p>12. Emergency equipment shall be located at well-marked and identified stations and shall be adequate to the needs of all personnel to escape from the area or to safely cope with the emergency on reentry.</p> <p><b>Hygiene practices</b></p> <p>13. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Phosgene (NIOSH 76-173, 2/76)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories: <ol style="list-style-type: none"> <li>a. Pre-existing cardiovascular or pulmonary disorders.</li> </ol> </li> <li>2. Physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Pulmonary function, including FVC, FEV1.0, and forced midexpiratory flow (FEF 25-75);</li> <li>b. Chest X-ray.</li> </ol> </li> <li>3. Ability to use negative or positive pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2, except for A.2.b.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 5 yrs after termination of employment for all employees exposed.</li> <li>2. Include chest X-rays for at least the 5 yrs preceding termination of employment, and the original preplacement X-rays.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN - SOCIAL SECURITY NUMBER  
DMR - DESIGNATED MEDICAL REPRESENTATIVE  
HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Phosgene (NIOSH 76-173, 2/76)	1. TWA: (0.1). 2. Ceiling limit for 15 min: (0.2). 3. Procedures for sampling, calibration of equipment, and analysis of environmental samples shall be as provided in Appendices I and II, or by any method shown to be equivalent in precision, accuracy, and sensitivity to the methods specified.	<b>Industrial hygiene survey</b> 1. Workroom areas where it has been determined, on the basis of an IH survey or the judgment of a compliance officer, that environmental levels of phosgene are less than 1/2 of the TWA limit should not be considered to have phosgene exposure.  <b>Area monitoring</b> 2. Continuous automatic monitoring is recommended in any work area where an initial IH survey indicates that a potential phosgene exposure exists. Such monitoring devices (see Appendix III) should have an audible or a visible alarm (light) which is triggered whenever the ceiling concentration limit is exceeded.  <b>Personal monitoring</b> 3. Each employer who has a place of employment in which phosgene is stored, handled, used, or formed shall design and implement a monitoring program which shall identify and measure or permit	<b>Protective clothing</b> 1. Personnel performing emergency operations involving exposure to liquid phosgene shall wear 1-piece suits, impervious to phosgene and tight at the ankles, wrists, and around the neck and face. The suits shall be ventilated with supplied air, preferably cooled, or time in the work area shall be limited with due consideration to the heat stress factors involved. 2. Impervious gloves and boots shall also be worn. 3. Such protective clothing shall be available at a convenient location outside the contaminated area. 4. The employer shall ensure a sufficient supply and adequate maintenance of protective clothing.  <b>Eye protection</b> 5. Personnel handling liquid phosgene in situations where eye contact can occur shall have eye protection afforded by full-face respiratory	1. IH survey records shall be maintained until a new survey is conducted. 2. Employers shall maintain records of any accidental phosgene release requiring evacuation, and results of all exposure measurements and environmental surveys. 3. Such records shall indicate the type of personal protective devices, if any, in use at the time of sampling. 4. Records of environmental monitoring shall be maintained and shall be available to the DR of the Sec. of HHS, and of the Sec. of Labor. 5. Each employee shall be able to obtain information on his or her own environmental exposures. 6. Such records shall be maintained for at least 5 yrs after the individual's employment is terminated.	Yes	Yes	Yes	1. Occupational exposure = exposure to phosgene above 1/2 the TWA.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Phosgene (continued)		<p>calculation of the exposure of all employees exposed to phosgene.</p> <p>4. Routine monitoring of employee exposure shall be conducted at 3-mo intervals unless otherwise indicated by a PIH and whenever introduction of a production, process, or control change indicates a need for reevaluation.</p> <p>5. If an employee monitoring program measurement reveals that an employee is exposed in excess of the recommended environmental limits, the exposure of that employee shall be measured at least once every 2 wks, control measures shall be implemented, and the employee shall be notified. When 2 consecutive biweekly determinations reveal that employee exposure no longer exceeds either of the recommended environmental limits, routine monitoring may be resumed.</p> <p>6. The minimum number of representative TWA determinations for an operation or process shall</p>	<p>protection, since concentrations of phosgene sufficient to cause eye damage are also likely to cause respiratory tract damage.</p> <p><b>Respiratory protection</b></p> <p>6. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure their use.</p> <p>7. Each work area where there is potential for occupational exposure to phosgene shall have at least 2 sets of self-contained breathing apparatus readily available in nearby locations which do not require entry into, or passage through, a contaminated area for access.</p> <p>8. Canisters shall be discarded and replaced with fresh canisters after use. Unused canisters shall be discarded and replaced when the seal is broken or when the shelf life, as recommended by the manufacturer, is exceeded.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>					

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Phosgene (continued)		<p>be based on the number of workers exposed, as provided in the table below or as otherwise indicated by a PIH.</p> <table><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></table>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the total number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers							
Number of Employees Exposed	Number of TWA Determinations																
1-20	50% of the total number of workers																
21-100	10 plus 25% of the excess over 20 workers																
> 100	30 plus 5% of the excess over 100 workers																

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Polychlorinated biphenyls (NIOSH 77-225, 9/77)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with special emphasis on:               <ol style="list-style-type: none"> <li>a. Hepatic functions;</li> <li>b. Skin condition;</li> <li>c. Reproductive history.</li> </ol> </li> <li>2. Comprehensive physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Hepatic functions (SGPT and SGOT activities);</li> <li>c. Serum triglyceride concentration and other indices of fat metabolism, as DBRP.</li> </ol> </li> <li>3. Ability to use positive pressure respirator.</li> </ol>	<b>At least annually</b> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment plus 30 yrs for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<b>If adverse health effects seen</b> <ol style="list-style-type: none"> <li>1. Appropriate medical care.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Polychlorinated biphenyls (NIOSH 77-225, 9/77)</b>	<ol style="list-style-type: none"> <li>1. TWA: 1.0 µg/m<sup>3</sup>.</li> <li>2. The recom- mended TWA occupational exposure limit for PCBs has been deter- mined to be the lowest reli- ably detectable limit by the sampling and analytical methods recommended. Environmental samples shall be collected and analyzed as described in Appendices I and II, or by any methods shown to be at least equivalent in accuracy, precision, and sensitivity to the methods specified.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Each employer who manufactures, processes, handles, stores, or other- wise uses PCBs shall determine by an IH survey whether occupational exposure to PCBs may occur.</li> <li>2. Surveys shall be repeated at least once every yr and within 30 days of any process change likely to result in occupational exposure to PCBs.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If occupational exposure to PCBs is determined to be possible, a program of personal monitoring shall be instituted to measure or permit calculation of the exposures of all employees.</li> <li>4. Each operation in each work area shall be sampled at least once every 3 mos.</li> <li>5. If an employee is found to be exposed to PCBs in excess of the TWA, control measures shall be initiated, the employee shall be notified of the exposure and of the control measures being imple- mented to correct the</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In any operation where workers may come into contact with PCBs, protective clothing impervious to PCBs shall be worn.</li> <li>2. Gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary.</li> <li>3. Protective apparel shall be made of materials which most effectively prevent skin contact with PCBs where it is most likely to occur.</li> <li>4. Employers shall ensure that all personal protective clothing is inspected regularly for defects and that it is in a clean and satisfactory condition.</li> </ol> <p><b>Eye protection</b></p> <ol style="list-style-type: none"> <li>5. Chemical safety goggles, face shields (8 in minimum) with goggles, or safety glasses with side shields shall be provided by employers and shall be worn during any operation in which PCBs are present.</li> <li>6. If liquid or solid PCBs contact the eyes, the eyes shall be irrigated</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be retained until the next survey has been completed.</li> <li>2. Environmental monitoring records shall be maintained for at least 30 yrs after the employee's last occu- pational exposure to PCBs.</li> <li>3. These records shall include the dates and times of measurements, job function and location of employees within the worksite, methods of sampling and analysis used, types of respiratory protection in use at the time of sampling, TWA concentrations found, and identification of exposed employees.</li> <li>4. Each employee shall be able to obtain information on his or her own environmental exposures.</li> <li>5. Daily rosters of authorized persons who enter regulated areas shall be retained for 30 yrs.</li> <li>6. Environmental monitoring records and entry rosters shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</li> </ol>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<ol style="list-style-type: none"> <li>1. Occupational exposure = working with PCBs or with equipment containing PCBs that can become airborne or that can spill or splash on the skin or into the eyes, or the handling of any solid products that may result in exposure to PCBs by skin contact or by inhalation.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Polychlorinated biphenyls (continued)		situation, and the employee shall be monitored every 30 days. Such monitoring shall continue until 2 consecutive determinations indicate that the employee's exposure no longer exceeds the TWA. Routine monitoring may then be resumed.	<p>immediately with large quantities of water and then examined by a physician or other responsible medical personnel. (A drop of vegetable oil on the eye has been found to reduce the resultant irritation.)</p> <p><b>Respiratory protection</b></p> <p>7. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that employees use the respirators provided.</p> <p><b>Hygiene practices</b></p> <p>8. Sanitation measures specified.</p>						



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p><b><math>\beta</math>-Propiolactone</b> <b>(1910.1013, 11/78)</b></p>	<ol style="list-style-type: none"> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Reduced immuno-competence;</li> <li>Steroid and cytotoxic treatments;</li> <li>Pregnancy;</li> <li>Smoking.</li> </ol> </li> <li>Personal, family, and occupational histories, including: <ol style="list-style-type: none"> <li>Genetic factors;</li> <li>Environmental factors.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain for the duration of employment for all authorized employees and all employees considered for assignment to regulated areas.</li> <li>Upon termination of employment, including retirement or death, or in the event that the employer ceases business without a true successor, records, or notarized true copies thereof, shall be forwarded by registered mail to the Director.</li> <li>Shall be provided upon request to employees, DMR, the Sec. of OSHA, and the Director of NIOSH.</li> <li>Any physician who conducts a medical examination for the purpose of compliance shall furnish to the employer a statement of the employee's suitability for employment in the specific exposure.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>β-Propiolactone</b> (1910.1013)		<ol style="list-style-type: none"> <li>1. A regulated area shall be established where β-propiolactone is manufactured, processed, used, packaged, released, handled, or stored.</li> <li>2. Access shall be restricted to authorized personnel.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. In operations involving "laboratory-type hoods," or where β-propiolactone is contained in an otherwise "closed system," but is transferred, charged, or discharged, employees shall be provided with, and required to wear, clean, full-body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers, and gloves prior to entering the regulated area.</li> <li>2. Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers shall be properly identified.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>3. Employees engaged in β-propiolactone handling</li> </ol>	<ol style="list-style-type: none"> <li>1. Any changes in operations shall be reported in writing within 15 calendar days of the change.</li> <li>2. The report shall include a brief description and inplant location of the area regulated and the address of each regulated area; the name and other identifying information as to the presence of β-propiolactone in each regulated area; the number of employees in each regulated area during normal operations, including maintenance activities; and the manner in which β-propiolactone is present in each regulated area.</li> <li>3. Incidents resulting in release of β-propiolactone into any area where employees may be exposed shall be reported within 24 hrs to the nearest OSHA Director.</li> <li>4. A written report shall be filed within 15 days after such an incident, and shall include a specification of the amount of material released, the amount of time involved, and an</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Open vessel system operations are prohibited.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>β-Propiolactone</b> (continued)			<p>operations involving transfer from a closed system, charging or discharging point operations, or otherwise opening a closed system shall be provided with, and required to wear, a full-face, supplied air respirator, of the continuous flow or pressure-demand type, in accordance with 1910.134.</p> <p><b>Hygiene practices</b></p> <p>4. Personal hygiene measures specified for work within isolated systems, for work in closed system operations, and for work involving transfer from a closed system or otherwise opening a closed system.</p>	<p>explanation of the procedure used in determining this figure; a description of the area involved and the extent of known employee exposure; any medical treatment given or surveillance implemented; an analysis of the circumstances of the incident; and measures taken to avoid further releases.</p>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Sodium hydroxide (NIOSH 76-105, 9/75)</p>	<ol style="list-style-type: none"> <li>1. Includes maintenance personnel.</li> <li>2. Comprehensive medical exam, looking for signs of irritation in: <ol style="list-style-type: none"> <li>a. Skin;</li> <li>b. Eyes;</li> <li>c. Upper respiratory tract.</li> </ol> </li> </ol>	<p><b>Not mentioned</b></p>	<ol style="list-style-type: none"> <li>1. Retain at least 5 yrs after termination of employment for all employees exposed and for maintenance personnel with occasional exposure.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>1. For those with signs/symptoms of skin, eye, or upper respiratory tract irritation from exposure: <ol style="list-style-type: none"> <li>a. Prompt medical attention.</li> </ol> </li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>2. In the event of injury due to exposure: <ol style="list-style-type: none"> <li>a. Remain under physician's care until recovery.</li> </ol> </li> </ol>

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN - SOCIAL SECURITY NUMBER  
DMR - DESIGNATED MEDICAL REPRESENTATIVE  
HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Sodium hydroxide (NIOSH 76-106, 9/75)</p>	<ol style="list-style-type: none"> <li>1. Ceiling limit for 15 min: 2.0.</li> <li>2. Procedures for sampling, calibration of equipment, and analysis of sodium hydroxide samples shall be as provided in Appendices I and II, or by any method shown to be equivalent to the methods specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Workroom areas will not be considered to have occupational exposure to sodium hydroxide if environmental levels, as determined on the basis of an IH survey or by the judgment of a compliance officer, do not exceed 1/2 of the workplace environmental limit.</li> <li>2. Surveys shall be repeated when any process change indicates a need for reevaluation or at the discretion of the compliance officer.</li> <li>3. Where there is sodium hydroxide exposure, samples representative of the exposure in the breathing zone of at least 25% of the employees in each operation or process shall be collected. Every employee shall be included in the sampling at least once every 2 yrs.</li> <li>4. Samples shall be collected and analyzed at least every 6 mos in accordance with Appendices I and II to evaluate whether or not the work environment</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. Sodium hydroxide will produce skin burns at the site of contact. Impervious protective clothing made of rubber, neoprene, or other caustic-resistant material, such as gloves, aprons, suits, hoods, boots, and overshoes, shall be provided by the employer and worn by the employee when there is a likelihood of body contact with sodium hydroxide.</li> <li>2. Sodium hydroxide-wetted clothing, unless impervious, shall be removed promptly.</li> <li>3. Work clothing should not be made from wool; cotton is preferred because it is not rapidly affected by sodium hydroxide. Pant legs should cover the tops of boots. Shirts should be long-sleeved and buttoned at the collar. Leather footwear does not provide adequate protection against spills of sodium hydroxide.</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained until a new survey is conducted.</li> <li>2. Records shall be maintained of accidental sodium hydroxide releases.</li> <li>3. Applicable records of all sampling and chemical analysis of airborne sodium hydroxide shall be maintained for at least 5 yrs after termination of employment.</li> <li>4. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling.</li> <li>5. Each employee shall be able to obtain information on his or her own environmental exposures.</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure to airborne concentrations of sodium hydroxide exceeding 1/2 the PEL.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Sodium hydroxide (continued)		<p>conforms with the recommended workplace environmental limit.</p> <p>5. Monitoring of the airborne sodium hydroxide in the workplace shall be repeated at 15-day intervals when the concentration has been found to exceed the recommended workplace environmental limit. In such cases, suitable controls shall be initiated, and monitoring shall continue at 15-day intervals, until 2 consecutive surveys indicate that exposures are at or below the recommended workplace environmental limit.</p> <p>6. Sampling and analysis of airborne sodium hydroxide shall be accomplished within 30 days after installation of a new process or process change.</p>	<p>4. Protective hats with brims shall be worn by workers at operations or in areas where there is a likelihood of overhead splashes or leaks. Where there is also danger of falling objects, hard hats with brims shall be worn. (Aluminum hard hats shall be excluded because they are incompatible with strong caustics.)</p> <p><b>Eye protection</b></p> <p>5. Eye protective equipment shall be provided by the employer and used by the employee where eye contact with sodium hydroxide is likely.</p> <p>6. At all operations where there is danger of sodium hydroxide (solid or in solution) coming in contact with the eyes, chemical safety goggles with resistant glass or plastic lenses and adequate air vents that do not allow entry of liquids shall be worn. Plastic chemical goggles may be worn over metal or plastic frame safety spectacles with</p>						



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN

SSAN - SOCIAL SECURITY NUMBER

DMR - DESIGNATED MEDICAL REPRESENTATIVE

HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>ENVIRONMENTAL STANDARD</b> mg/m<sup>3</sup> (ppm)</p>	<p><b>MONITORING REQUIREMENTS</b></p>	<p><b>PERSONAL PROTECTIVE REQUIREMENTS</b></p>	<p><b>RECORDKEEPING REQUIREMENTS</b></p>	<p><b>T R A I N I N G</b></p>	<p><b>L A B E L I N G</b></p>	<p><b>P O S T I N G</b></p>	<p><b>P R A C T I C E S</b></p>	<p><b>ADDITIONAL INFORMATION</b></p>
<p>Sodium hydroxide (continued)</p>			<p>prescription safety lenses. Safety spectacles may not be used alone for protection from splashes, mists, or dust of sodium hydroxide.</p> <p>7. At any operation where splashes of sodium hydroxide solution are likely to occur and there is danger of such splashes striking the face, a full-length (8 in minimum) plastic face shield shall be worn in addition to chemical safety goggles.</p> <p><b>Respiratory protection</b></p> <p>8. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>9. Where an emergency may develop which could result in employee injury from sodium hydroxide, the employer shall provide an escape device as listed in Table I-1.</p> <p><b>Hygiene practices</b></p> <p>10. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Sulfur dioxide (NIOSH 74-111, 2/74)	<ol style="list-style-type: none"> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Eyes;</li> <li>Cardiopulmonary system;</li> <li>Mucous membrane irritation and cough, particularly.</li> </ol> </li> <li>Ability to use negative or positive pressure respirator.</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 20 yrs after termination of employment for all persons employed 1 or more yrs in work involving exposure. Also retain X-rays for the 5 yrs preceding termination of employment.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Sulfur dioxide (NIOSH 74-111, 2/74)	1. TWA: 5 (2). 2. Procedures for sampling, calibration of equipment, and analysis of environmental samples shall be as provided in Appendix I, or by any method shown to be equivalent in accuracy, precision, and sensitivity to the method specified.	1. Workroom areas where it has been determined on the basis of an IH survey or the judgment of a compliance officer that environmental levels do not exceed 1/2 the environmental standard shall not be considered to have sulfur dioxide exposure. 2. Surveys shall be repeated when any process change indicates a need for reevaluation or at the discretion of the compliance officer. 3. In areas where there is environmental exposure, environmental monitoring shall be conducted. 4. In all monitoring, samples representative of the exposure in the breathing zone of employees shall be collected. An adequate number of samples shall be collected to permit construction of a TWA exposure for every operation or process. The minimum number of representative TWA determinations for an operation or process shall be based on the number	<b>Eye protection</b> 1. Metal or plastic rim safety spectacles with unperforated side shields, or suitable all-plastic safety goggles may be used where continuous eye protection is desirable. If use of this type of eye protection is mandatory, prescription lenses shall be provided for those employees who need them. 2. Cup-type or rubber-framed goggles, equipped with approved impact-resistant glass or plastic lenses, shall be worn whenever there is danger of eye contact, such as working with pipelines, valves, etc., which might leak and spurt liquid sulfur dioxide. 3. Plastic shields with forehead protection may be worn in place of or in addition to goggles. <b>Respiratory protection</b> 4. Appropriate respirators shall be provided and used when a variance has been granted to allow respirators as a means of control of exposure to routine operations and while the application is pending.	1. IH survey records shall be maintained until a new survey is conducted. 2. Records of all sampling shall be maintained for at least 20 yrs after termination of employment. 3. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling. 4. Records shall be maintained so that they can be classified by employee. 5. Each employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Occupational exposure = exposure to a concentration of sulfur dioxide equal to or above 1/2 the PEL.

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Sulfur dioxide (continued)		<p>of workers exposed as provided in the table below.</p> <table><thead><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr></thead><tbody><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>5. Environmental samples shall be taken within 30 days after installation of a new process or process changes.</p> <p>6. Samples shall be collected at least quarterly in accordance with Appendix I for the evaluation of the work environment with respect to the recommended standard.</p> <p>7. Environmental monitoring of an operation or process shall be repeated at 15-day intervals when sulfur dioxide concentration has been found to exceed the</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the total number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>Respirators shall also be provided and used for nonroutine operations (occasional brief exposures above the TWA of 2 ppm and for emergencies).</p> <p>5. The respirator and cartridge or canister used shall be of the appropriate class, as determined on the basis of exposure to sulfur dioxide gas.</p> <p>6. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>7. Wherever bulk sulfur dioxide is handled, emergency and escape type respirators shall be made readily available for each worker.</p> <p><b>Work clothing</b></p> <p>8. Work clothing should be changed at least twice a week or more frequently if required.</p> <p>9. Sulfur dioxide-wetted clothing, unless impervious, shall be removed promptly.</p>					
Number of Employees Exposed	Number of TWA Determinations															
1-20	50% of the total number of workers															
21-100	10 plus 25% of the excess over 20 workers															
> 100	30 plus 5% of the excess over 100 workers															

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Sulfur dioxide (continued)		recommended environ- mental standard. In such cases suitable controls shall be initiated and monitoring shall continue at 15-day intervals until 2 consecutive surveys indicate the adequacy of these controls.							



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Sulfuric acid (NIOSH 74-128, 6/74)</p>	<p>1. Medical exam:</p> <ul style="list-style-type: none"> <li>a. Teeth, for dental erosion;</li> <li>b. Eyes;</li> <li>c. Skin;</li> <li>d. Cardiopulmonary system;</li> <li>e. Mucous membrane irritation and cough.</li> </ul>	<p><b>Annually</b></p> <p>1. Same as in A.</p>	<p>1. Retain at least 20 yrs after termination of employment for all persons employed 1 or more yrs in work involving exposure. Also retain X-rays for the 5 yrs preceding termination of employment.</p> <p>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</p> <p>3. Physicians designated and authorized by the employee shall have access to his medical records.</p>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Sulfuric acid (NIOSH 74-128, 6/74)	1. TWA: 1. 2. Procedures for sampling, calibration of equipment, and analysis of environmental samples shall be as provided in Appendix 1, or by any method shown to be equivalent in accuracy, precision, and sensitivity to the method specified.	1. Workroom areas where it has been determined on the basis of an IH survey or the judgment of a compliance officer that environmental levels do not exceed 1/2 the environmental standard shall not be considered to have sulfuric acid exposure. 2. Surveys shall be repeated when any process change indicates a need for reevaluation or at the discretion of the compliance officer. 3. For areas in which there is sulfuric acid exposure, samples representative of the exposure in the breathing zone of employees shall be collected. 4. An adequate number of samples shall be collected to permit construction of a TWA exposure for every operation or process. The minimum number of representative TWA determinations for an operation or process shall be based on the number of workers exposed as provided in the table below.	<b>Protective clothing</b> 1. Skin contact with sulfuric acid will produce burns at the site of contact. Impervious protective clothing, such as rubber gloves, aprons, suits, hoods, and boots shall be provided by the employer and used by the employee as appropriate to the severity and likelihood of body contact with liquid acid. 2. Sulfuric acid-wetted clothing, unless impervious, shall be removed promptly. 3. Protective clothing should be changed at least twice a wk, or more frequently if required. <b>Eye protection</b> 4. Eye protective equipment shall be provided by the employer and used by the employee where eye contact with liquid sulfuric acid is likely. 5. Cup-type, cover-cup-type, or rubber-framed goggles, equipped with approved impact-resistant glass or	1. IH survey records shall be retained until a new survey is conducted. 2. Employers shall maintain records of accidental sulfuric acid release requiring evacuation. 3. Records of all sampling and medical examinations shall be maintained for at least 20 yrs after the individual's employment is terminated. 4. Records shall indicate the type of personal protective devices, if any, in use at the time of sampling. 5. Records shall be maintained so that they can be classified by employee. 6. Each employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Occupational exposure = exposure to a concentration of liquid, mist, or special dry powder of sulfuric acid, or to sulfur trioxide associated with oleum (fuming sulfuric acid) equal to or above 1/2 the PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION							
Sulfuric acid (continued)		<table><thead><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr></thead><tbody><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>5. Samples shall be collected at least semiannually in accordance with Appendix I for the evaluation of the work environment with respect to the recommended standard.</p> <p>6. Environmental monitoring of an operation or process shall be repeated at 15-day intervals when the sulfuric acid concentrations have been found to exceed the recommended environmental standard. In such cases, suitable controls shall be initiated, and monitoring shall continue at 15-day intervals until 2 consecutive surveys indicate the adequacy of the controls.</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the total number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers	<p>plastic lenses, shall be worn whenever there is danger of sulfuric acid eye contact.</p> <p>6. Full-length, 8 in minimum plastic shields with forehead protection may be worn in place of, or in addition to, goggles. If there is danger of material striking the eyes from underneath, or around the sides of the face shield, chemical safety goggles should be worn as added protection.</p> <p><b>Respiratory protection</b></p> <p>7. Respirators shall be used whenever a variance is granted under provisions of the Occupational Safety and Health Act and in the interim period during the application for a variance because the recommended exposure limits cannot be met by controlling the concentration of sulfuric acid in the work environment.</p> <p>8. Respirators shall also be provided and used for nonroutine operations (occasional brief exposures above the TWA of 1 mg/cu m and for emergencies).</p>					
Number of Employees Exposed	Number of TWA Determinations															
1-20	50% of the total number of workers															
21-100	10 plus 25% of the excess over 20 workers															
> 100	30 plus 5% of the excess over 100 workers															

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Sulfuric acid (continued)</b>		7. Environmental samples shall be taken within 30 days after installation of a new process or process change.	9. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.  10. The respirator and cartridge or canister used shall be of the appropriate class, as determined on the basis of exposure to sulfuric acid.  11. Emergency and escape-type respirators shall be made immediately available at the work stations for each worker.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
1,1,2,2-Tetrachloroethane (NIOSH 77-121, 12/76)	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with emphasis on: <ol style="list-style-type: none"> <li>Liver;</li> <li>Kidneys;</li> <li>Nervous system;</li> <li>Exposure to other chemicals;</li> <li>Episodes of nausea, vomiting, dizziness, headache.</li> </ol> </li> <li>Physical exam.</li> <li>Liver function test (SGPT, SGOT)</li> <li>Screening tests of nervous system function, as DBRP.</li> <li>Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain at least 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<ol style="list-style-type: none"> <li>If contact with liquid or vapor at or above the action level: <ol style="list-style-type: none"> <li>Physical exam as in A.2 and any other tests as DBRP.</li> </ol> </li> </ol> <p><b>In an emergency</b></p> <ol style="list-style-type: none"> <li>First aid, followed by prompt medical evaluation and care.</li> <li>24-hr observation for CNS depression.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S  W O R K	ADDITIONAL INFORMATION
1,1,2,2-Tetra- chloroethane (NIOSH 77-121, 12/76)	1. TWA: 6.87 (1.0).  2. Procedures for the collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any method shown to be at least equivalent in precision, accuracy, and sensitivity to the methods specified.	Industrial hygiene survey  1. Each employer who has a place of employment in which tetrachloroethane is present shall determine by an IH survey if exposure to airborne tetrachloroethane at concentrations above the action level may occur.  2. Surveys shall be repeated at least once every yr and within 30 days of any process change likely to result in an increase of airborne tetrachloroethane concentrations.  3. If it has been decided that the environmental concentration of tetrachloroethane may exceed the action level, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to airborne tetrachloroethane.  4. Source and area monitoring may be used to supplement personal monitoring.  5. Each operation in each work area shall be sampled at least once every 3 mos or as otherwise indicated	Protective clothing  1. Protective clothing, including gloves, aprons, suits, boots, and face shields (8 in minimum) and goggles, made of a material resistant to tetrachloroethane, shall be worn where needed to prevent skin contact.  Eye protection  2. Chemical safety goggles, face shields and goggles, or safety glasses with side shields shall be provided by the employer and shall be worn during any operation in which tetrachloroethane is present.  Respiratory protection  3. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided when necessary.  4. The employer shall ensure that respirators are adequately cleaned and maintained, and that employees are trained and drilled, at least annually, in the proper use and testing for leakage of respirators assigned to them.	1. IH survey records shall be maintained.  2. Records of environmental monitoring shall be maintained for at least 30 yrs.  3. These records shall include the dates and times of measurements; job function and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken, TWA concentrations estimated from these samples, type of personal protective equipment used, if any; and exposed employees' names.  4. Each employee shall be able to obtain information on his or her own environmental exposures.  5. These records shall be available to the DR of the Sec. of HHS, and of the Sec. of Labor.	Yes	Yes	Yes	1. Occupational exposure = work in any area where tetrachloroethane is stored, produced, processed, or other- wise used.  2. Action level = 1/2 the recommended TWA.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>1,1,2,2-Tetra- chloroethane (continued)</p>		<p>by a PIH. If an employee is found to be exposed at a level in excess of the TWA environmental limit, the exposure of that employee shall be measured at least once every 30 days, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee exposure no longer exceeds the environmental limit. Quarterly monitoring may then be resumed.</p>	<p>5. Respirators shall be easily accessible, and employees shall be informed of their location.</p> <p><b>Hygiene practices</b></p> <p>6. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Tetrachloroethylene (NIOSH 76-185, 7/76)</p>	<ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Neurological;</li> <li>b. Cardiovascular;</li> <li>c. Liver function;</li> <li>d. Skin condition.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If adverse health effects seen</b></p> <ol style="list-style-type: none"> <li>1. Proper medical management.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm).	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Tetrachloroethylene (NIOSH 76-185, 7/76)	<div>1. TWA: 339 (50).</div> <div>2. Ceiling limit for 15 min, twice daily: 678 (100).</div> <div>3. Procedures for sampling and analysis for workroom air shall be as provided in Appendices I and II, or by any method shown to be at least equivalent.</div>	<div>Industrial hygiene survey</div> <div>1. Workers are not considered to be occupationally exposed to tetrachloroethylene if environmental concen- trations, as determined on the basis of an IH survey, do not exceed the action level, i.e., 1/2 the recommended TWA environmental limit; or if there is no operation, storage, or handling of tetrachloroethylene in any form or contamination of workplace air by tetrachloroethylene from other sources.</div> <div>2. These surveys shall be repeated at least every 3 yrs and within 30 days after any process or operating change likely to result in increases of airborne concentrations of tetrachloroethylene.</div> <div>3. When the action level is exceeded, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occu- pationally exposed to tetrachloroethylene.</div>	<div>Protective clothing</div> <div>1. In any operation where the worker may come into direct contact with liquid tetrachloroethylene, protective clothing should be worn.</div> <div>2. The clothing should be resistant to tetrachloroethylene.</div> <div>3. In operations where repeated contact with tetrachloroethylene is necessary, impervious gloves and other appropriate clothing should be worn.</div> <div>4. Gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary.</div> <div>5. Impervious supplied-air hoods or suits shall be worn when entering confined spaces such as pits or tanks unless known to be safe.</div> <div>6. In situations where heat stress is likely to occur, air-supplied suits shall be used.</div> <div>7. All protective clothing shall be well-aired and</div>	<div>1. IH records shall be retained until a new survey has been completed.</div> <div>2. Environmental monitoring records shall be maintained for at least 20 yrs.</div> <div>3. These records shall include methods of sampling and analysis used, types of respiratory protection used, and TWA and ceiling concentrations found.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = exposure at a concentration greater than the action level.</div> <div>2. Action level = 1/2 the TWA.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING</p>	<p>POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>Tetrachloroethylene (continued)</b></p>		<p>4. This sampling and analysis shall be conducted every 3 mos on at least 25% of the workers so that each worker's exposure is measured at least every yr; this frequency and percentage of employees sampled may be different if so directed by a PIH.</p> <p>5. If monitoring of any worker shows exposure in excess of the recommended environmental limit, additional monitoring shall be promptly initiated.</p> <p>6. If confirmed, control procedures shall be instituted as soon as possible; these may precede and obviate confirmatory monitoring if the employer desires. Affected employees shall be advised that exposures have been excessive and be notified of the control procedures being implemented. Monitoring of these employees shall be conducted at least as often as every 30 days and shall continue until 2 successive samplings, at least 1 wk</p>	<p>inspected for defects prior to reuse.</p> <p><b>Eye protection</b></p> <p>8. Eye protection shall be provided for, and worn by, any employee engaged in an operation where tetrachloroethylene liquid or mist may enter the eye.</p> <p>9. Chemical-type goggles or safety glasses with splash shields made completely of tetrachloroethylene-resistant materials shall be used.</p> <p><b>Respiratory protection</b></p> <p>10. When respirators are required the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>11. Where an emergency may develop that could result in employee injury from overexposure to tetrachloroethylene, the employer shall provide respiratory protection as listed in Table I-1.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Tetrachloroethylene (continued)		apart, confirm that exposure no longer exceeds recommended limits. Normal monitoring may then be resumed.							



# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Thiols: n-Alkane monothiols Cyclohexanethiol Benzenethiol (NIOSH 78-213, 9/78)</p>	<ol style="list-style-type: none"> <li>Medical and work histories, with attn to: <ol style="list-style-type: none"> <li>Central nervous system disorders;</li> <li>Autonomic nervous system disorders;</li> <li>Cardiovascular conditions;</li> <li>Skin conditions.</li> </ol> </li> <li>Physical exam, with attn to: <ol style="list-style-type: none"> <li>Nervous system;</li> <li>Cardiovascular system;</li> <li>Eye exam (for benzenethiol exposure only).</li> </ol> </li> <li>Clinical tests: <ol style="list-style-type: none"> <li>White blood cell count (total and differential);</li> <li>Hematocrit;</li> <li>Hemoglobin concentration in whole blood;</li> <li>Total bilirubin;</li> <li>Urinalysis;</li> <li>Estimate of fecal urobilinogen.</li> </ol> </li> </ol>	<p><b>At least annually</b></p> <ol style="list-style-type: none"> <li>Interim medical and work histories.</li> <li>Physical exam.</li> <li>Laboratory exam.</li> <li>Referral for more diagnostic testing if neurological disturbances found.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 30 yrs after termination of employment for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	<p><b>If overexposed</b></p> <ol style="list-style-type: none"> <li>First aid and prompt medical attention.</li> <li>72-hr observation for delayed system effects.</li> </ol>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Thiols:</b> <b>n-Alkane monothiols</b> <b>Cyclohexanethiol</b> <b>Benzenethiol</b> <b>(NIOSH 78-213, 9/78)</b>	<p>1. Ceiling limit for 15 min: benzenethiol: 0.5 (0.1). Aliphatic thiols include:</p> <p>1-methanethiol: 1.0 (~0.5); 1-ethanethiol: 1.3 (~0.5); 1-propanethiol: 1.6 (~0.5); 1-butanethiol: 1.8 (~0.5); 1-pentanethiol: 2.1 (~0.5); 1-hexanethiol: 2.4 (~0.5); 1-heptanethiol: 2.7 (~0.5); 1-octanethiol: 3.0 (~0.5); 1-nonanethiol: 3.3 (~0.5); 1-decanethiol: 3.6 (~0.5); 1-undecanethiol: 3.9 (~0.5); 1-dodecanethiol: 4.1 (~0.5); 1-tridecanethiol: 5.3 (~0.5); 1-tetradecanethiol: 5.9 (~0.5); cyclohexanethiol: 2.4 (~0.5).</p> <p>2. Mixture of thiols: No employee shall be exposed at an equivalent concentration for the mixture greater than that calculated by the formula given in 29 CFR 1910.1000 (d)(2)(i).</p> <p>3. Procedures for the collection and analysis of workroom air</p>	<p><b>Industrial hygiene survey</b></p> <p>1. Employers shall determine by an IH survey whether exposure to airborne thiols is in excess of the environmental limit.</p> <p>2. Surveys shall be repeated at least annually and within 30 days of any process change.</p> <p><b>Personal monitoring</b></p> <p>3. When the IH survey demonstrates that the environmental concentration of thiols exceeds the PEL, a program of personal monitoring shall be instituted to identify occupationally exposed employees and to measure their exposure to thiols.</p> <p>4. Source and area monitoring may be used to supplement personal monitoring.</p> <p>5. Procedures for sampling and analysis of thiols shall be in accordance with Appendix I.</p> <p>6. Each operation shall be sampled at least once every 3 mos or as otherwise indicated by a PIH.</p>	<p><b>Protective clothing</b></p> <p>1. Depending on the operations involved and the probable or likely extent of dermal exposure, protective clothing and equipment, including gloves, aprons, suits, boots, and face shields (8 in minimum) with goggles, shall be worn to prevent skin contact with particulate or splashed liquid thiols.</p> <p><b>Eye protection</b></p> <p>2. Safety glasses with side shields shall be worn whenever there is occupational exposure to thiols.</p> <p>3. Chemical safety goggles and face shields (8 in minimum) shall be provided and worn in any operation in which there is a reasonable possibility that thiols may be splashed into the eyes.</p> <p><b>Respiratory protection</b></p> <p>4. Employers shall provide respirators in accordance with Tables I-2 and I-3 and shall ensure that employees use the respirators when necessary.</p>	<p>1. IH survey records shall be kept.</p> <p>2. Records of environmental monitoring shall be retained for at least 30 yrs after employment ends.</p> <p>3. These records shall include the dates and times of measurement; duties and location of the employees within the worksite; sampling and analytical methods used; number, duration, and results of the samples taken; ceiling concentrations estimated from these samples; type of personal protective equipment used, if any; and employees' names.</p> <p>4. Records of environmental exposures applicable to an employee shall be included in the employee's medical records.</p> <p>5. Records of environmental monitoring shall be available to the DR of the Sec. of Labor, of the Sec. of HHS, of the employer, and of the employee or former employee.</p>	Yes	Yes	Yes	<p>1. Occupational exposure = work in any area where thiols are produced, processed, stored, or otherwise used.</p>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
<b>Thiols:</b> <b>n-Alkane monothiols</b> <b>Cyclohexanethiol</b> <b>Benzenethiol</b> <b>(continued)</b>	samples shall comply with those given in Appendix I, or by any method shown to be at least equivalent in precision, sensitivity, and accuracy.	7. If an employee is found to be exposed at a level in excess of the environmental limit, the exposure of that employee shall be measured at least weekly, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, 1 wk apart, indicate that exposures no longer exceed the environmental limit. Quarterly monitoring shall then be resumed.	5. Employers shall ensure that respirators are properly cleaned and maintained and that employees are trained and drilled at least annually in the use of respirators assigned to them and in the ways to test for leaks.  6. Respirators shall be easily accessible, and employees shall be informed of their location.  <b>Hygiene practices</b>  7. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>o-Tolidine</b> <b>(NIOSH 78-179, 8/78)</b>	<ol style="list-style-type: none"> <li>Comprehensive medical and work histories, with emphasis on:               <ol style="list-style-type: none"> <li>Urinary tract.</li> </ol> </li> <li>Comprehensive physical exam, including:               <ol style="list-style-type: none"> <li>Urinalysis, with microscopic exam;</li> <li>Double-check 2.a if proven abnormal, do comprehensive analysis.</li> </ol> </li> <li>Ability to use positive pressure respirator.</li> </ol>	<b>Annually</b> 1. Same as in A.1 and 2, except 2.a.  <b>Quarterly</b> 2. Urinalysis, as in A.2.a.	<ol style="list-style-type: none"> <li>Retain 30 yrs after last exposure for all employees exposed.</li> <li>Include environmental exposure records.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p><b>o-Tolidine</b> <b>(NIOSH 78-179, 8/78)</b></p>	<ol style="list-style-type: none"> <li>1. Ceiling limit for 1 hr: 20 µg/m<sup>3</sup>.</li> <li>2. Procedures for the collection and analysis of environmental samples shall be as provided in Appendix I, or by any methods shown to be at least equivalent in precision, accuracy, and sensitivity to the methods specified.</li> </ol>	<p><b>Industrial hygiene survey</b></p> <ol style="list-style-type: none"> <li>1. Each employer who has a place of employment in which o-tolidine is stored, produced, processed, or otherwise handled shall determine by an IH survey the areas in which occupational exposure to o-tolidine occurs.</li> <li>2. Surveys shall be repeated at least annually and within 14 days after any process change likely to result in occupational exposure to o-tolidine.</li> </ol> <p><b>Personal monitoring</b></p> <ol style="list-style-type: none"> <li>3. If it has been determined that occupational exposure to o-tolidine occurs, a program of personal monitoring shall be instituted to identify and measure the exposure of each employee.</li> <li>4. Source and area monitoring may be used to supplement personal monitoring.</li> <li>5. Each operation in each regulated area shall be sampled at least once every 6 mos while o-tolidine is produced or handled.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. All employees entering the regulated area shall be equipped with clean work clothing (long-sleeved shirts, trousers, underwear, and footwear) and with the necessary protective equipment.</li> <li>2. Full-body protection with appropriate head covering and air supply shall be used in weighing and charging operations in which there is occupational exposure to o-tolidine.</li> <li>3. At no time shall protective equipment be stored in the regulated area.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>4. Respirators may be used only during the time necessary to install and test the required engineering controls and during nonroutine operations or maintenance and repair activities in which brief exposure to o-tolidine dust or vapor may occur.</li> <li>5. Respirators, when permitted, shall be supplied-air or self-contained positive pressure respirators with full facepiece.</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained until a new survey is completed.</li> <li>2. Records of environmental monitoring and other pertinent records shall be kept for at least 30 yrs after the employee's last occupational exposure to the o-tolidine.</li> <li>3. Records of environmental monitoring shall include an identification of the employee being monitored; duties and job location within the worksite; time and dates of sampling and analysis; sampling and analytical methods used and available evidence of their precision and accuracy; the number, duration, and results of samples taken; environmental concentrations determined from these samples; and the type of personal protective equipment used by the employee.</li> <li>4. Rosters of authorized persons who enter regulated areas shall also be retained for at least 30 yrs.</li> <li>5. Environmental monitoring records and entry rosters</li> </ol>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<ol style="list-style-type: none"> <li>1. Occupational exposure = work in any area in which o-tolidine is produced, stored, used, packaged, or distributed.</li> <li>2. Skin contact shall be avoided.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>o-Tolidine (continued)</b>		<p>6. For intermittent operations, i.e., those lasting less than 6 mos, at least 1 monitoring regimen shall be conducted during each operation period and monitoring should coincide with the periods of maximum potential exposure to o-tolidine during the intermittent operations.</p> <p>7. If an employee is found to be exposed to o-tolidine at concentrations exceeding the recommended ceiling limit, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that control measures are effective in that the employee's exposure no longer exceeds the recommended occupational exposure limit; routine semiannual monitoring may then be resumed.</p>	<p>6. All respiratory protective devices should be worn with full-body clothing resistant to penetration by o-tolidine.</p> <p>7. Employers shall ensure that employees use the respiratory protective equipment when necessary.</p> <p>8. Respirators shall be easily accessible. If respirators for more than one purpose are present, employees shall be taught to recognize the proper one.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures as specified.</p>	<p>shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</p> <p>6. Employees shall have access to data on their environmental exposures.</p>					



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Toluene (NIOSH 73-11023, 7/73)	1. Medical exam: a. Headache, nausea, dizziness; b. Attn to complaints and evidence of irritations of: i. Eyes; ii. Mucous membranes; iii. Skin. 2. Lab tests: a. Complete blood count; b. Urinalysis.	Biennially 1. Same as in A.	No requirements specified.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Toluene (NIOSH 73-11023, 7/73)	<div>1. TWA: 375 (100).</div> <div>2. Ceiling limit for 10 min: 750 (200).</div> <div>3. Procedures for collection and analysis of environmental samples shall be as provided in Appendix I, or by any method shown to be equivalent in accuracy, precision, and sensitivity to the method specified.</div>	<div>1. Workroom areas where it has been determined, on the basis of an IH survey or the judgment of a compliance officer, that environmental levels do not exceed 1/2 the environmental standard shall not be considered to have toluene exposure.</div> <div>2. In workroom areas considered to have toluene exposure, employers shall monitor environmental levels of toluene at least semiannually, except as otherwise indicated by a PIH survey.</div> <div>3. If the TWA or ceiling concentrations are at or above the standard, environmental levels shall be monitored monthly. This increased frequency of monitoring shall be continued until at least 2 30-day monitoring periods have demonstrated environmental levels which are at or below the standard.</div> <div>4. Air samples shall be collected in the breathing zone of workers to permit calculation of a TWA exposure and ceiling</div>	<div>Respiratory protection</div> <div>1. Appropriate respirators shall be provided and used when a variance has been granted to allow respirators as a means of control of exposure to routine operations and while the application is pending. Administrative controls should also be used to reduce exposure. Respirators shall also be provided and used for nonroutine operations (occasional brief exposures above the TWA of 100 ppm and for emergencies).</div> <div>2. Employees experiencing breathing difficulty while wearing respirators shall be medically examined to determine their ability to wear the respirator.</div> <div>3. When permissible, the employer shall provide respirators in accordance with Table I-1, and shall ensure that the employee uses the respirator provided.</div> <div>4. Respiratory protective devices shall be either those approved under</div>	<div>1. IH survey records shall be maintained.</div> <div>2. Records shall be maintained for all sampling schedules to include the sampling methods, analytical methods, type of respiratory protection in use (if applicable), and the TWA and ceiling concentrations of toluene in each work area.</div> <div>3. Records of results shall be maintained so that they can be classified by employee; they shall be made available to each employee.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = exposure to a concentration of toluene equal to or above 1/2 the PEL.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION							
Toluene (continued)		<p>concentration for every toluene exposure area.</p> <p>5. As a minimum, samples for determination of the following number of TWA and ceiling concentrations shall be collected and analyzed, based on the number of workers exposed in any toluene exposure area, as provided in the table below or as otherwise indicated by an IH survey.</p> <table><thead><tr><th>Number of Employees Exposed</th><th>Number of Samples</th></tr></thead><tbody><tr><td>1-20</td><td>5 samples or 50% of the total number of workers, whichever is greater</td></tr><tr><td>20-100</td><td>10 samples plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 samples plus 5% of the excess over 100 workers</td></tr></tbody></table>	Number of Employees Exposed	Number of Samples	1-20	5 samples or 50% of the total number of workers, whichever is greater	20-100	10 samples plus 25% of the excess over 20 workers	> 100	30 samples plus 5% of the excess over 100 workers	<p>the following listed regulations or those approved under 30 CFR 11, published March 25, 1972, or future amendments.</p> <p>a. Gas masks—30 CFR 13 (Bureau of Mines Schedule 14F);</p> <p>b. Supplied-air respirators—30 CFR 12 (Bureau of Mines Schedule 19B);</p> <p>c. Self-contained breathing apparatus—30 CFR 11 (Bureau of Mines Schedule 13E);</p> <p>d. Chemical cartridge respirators—30 CFR 14 (Bureau of Mines Schedule 23B).</p> <p><b>Work clothing</b></p> <p>5. If operations require continued exposure to liquid toluene, workers should wear impervious clothing, gloves, or coverings to protect the potentially exposed area of the body.</p> <p>6. Toluene-wetted clothing, unless impervious, shall be removed promptly.</p>					
Number of Employees Exposed	Number of Samples															
1-20	5 samples or 50% of the total number of workers, whichever is greater															
20-100	10 samples plus 25% of the excess over 20 workers															
> 100	30 samples plus 5% of the excess over 100 workers															

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G P O S T I N G</b>	<b>P R A C T I C E S W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Toluene (continued)</b>			<ol style="list-style-type: none"> <li>7. Workers wearing toluene-wetted clothing shall not go near heaters or open flames.</li> <li>8. Toluene-wetted clothing shall not be placed in proximity of flames, heaters, or spark-producing equipment.</li> <li>9. Work clothing should be changed at least twice a wk or more frequently if required.</li> <li>10. Glasses having shatter-resistant glass or equivalent lenses and side shields shall be worn when there is a danger of liquid toluene splashing into the eye.</li> </ol>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>Toluene diisocyanate (NIOSH 73-11022, 1973)</p>	<ol style="list-style-type: none"> <li>1. Comprehensive medical history, with attn to:               <ol style="list-style-type: none"> <li>a. Respiratory allergy;</li> <li>b. Previous sensitization to TDI;</li> <li>c. Chronic bronchitis;</li> <li>d. Emphysema;</li> <li>e. Disabling pneumoconiosis;</li> <li>f. Cardiopulmonary disease with significantly impaired ventilatory capacity;</li> <li>g. Allergy other than respiratory.</li> </ol> </li> <li>2. Comprehensive physical exam, with:               <ol style="list-style-type: none"> <li>a. 14" x 17" chest X-ray;</li> <li>b. Total red blood cell count with differential;</li> <li>c. Baseline FVC and FEV1.0;</li> <li>d. Absolute eosinophil count on capillary blood;</li> <li>e. Respiratory symptoms (e.g., breathlessness, cough, sputum production, wheezing, tightness in chest);</li> <li>f. Smoking.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A, except for 2.a.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs, or if the employee dies, 1 yr after his death, for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> <li>3. Physicians designated and authorized by the employee shall have access to his medical records.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Toluene diisocyanate (NIOSH 73-11022, 1973)	1. TWA: 0.036 (0.005).  2. Ceiling limit for 20 min: 0.14 (0.02).  3. Procedures for sampling, calibration of equipment, and analysis of TDI samples shall be as provided in Appendices I and II, or by methods shown to be equivalent or better in sensitivity, precision, and accuracy.	1. Except as otherwise indicated by an IH survey, breathing zone samples shall be collected at least monthly to permit con- struction of a TWA exposure for every operation in which there is a potential for exposure to airborne TDI, so that each employee or employee location is sampled at least every 6 mos.  2. If monthly sampling shows the TWA or ceiling values to be exceeded, immediate steps shall be taken to reduce the exposure. Weekly sampling of the station shall be instituted and continued until all samples for 2 consecutive wks meet the standard.  3. Weekly monitoring shall also be conducted whenever there is a change in process or in materials used that could result in increased exposure of workers. This shall continue until all samples for 2 consecutive wks meet the standard.	<b>Protective clothing</b>  1. Where there is the likelihood of skin contact with TDI, the employer shall provide employees with impervious clothing.  2. This clothing must be cleaned inside and out each time it is used.  3. Rubber shoes or rubber over leather shoes shall be worn where there is a possibility of foot contact with TDI.  4. Rubbers shall be decontaminated and ventilated after contamination.  5. Leather shoes contaminated with TDI shall be decontaminated or disposed of.  6. Workers within 10 ft of spray operations, or at greater distances when there is a greater drift of spray, shall be protected with impervious clothing, gloves, and footwear in addition to a supplied-air impervious hood.  <b>Eye protection</b> 7. Chemical workers' goggles shall be worn where splashes are likely to occur.	1. Records shall be maintained of all sampling schedules and shall include the type of personal protective devices in use, if any, and the sampling and analytical methods in use.  2. Records shall be classified or readily classified by employee, so that each employee has reasonable access to records of his or her own environmental exposures.  3. These records shall be maintained for 20 yrs, or, if the employee dies sooner, 1 yr after his death.	Yes	Yes	Yes	1. Exposure to TDI = work in any area where TDI is stored, transported, or used.	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Toluene diisocyanate (continued)</p>			<p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>8. Appropriate respirators shall be provided and used when a variance has been granted to allow respirators as a means of control of exposure to routine operations and while the application is pending.</li> <li>9. Respirators shall also be provided and used for nonroutine operations (occasional brief exposures above the limits and for emergencies).</li> <li>10. In addition, appropriate respirators and work clothing shall be provided to and used by employees involved in spray operations.</li> <li>11. Respiratory protective devices shall be either those approved under the following listed regulations or under 30 CFR 11, published March 25, 1972:               <ol style="list-style-type: none"> <li>a. Gas mask—30 CFR 13 (Bureau of Mines Schedule 14F);</li> <li>b. Type C continuous flow, supplied-air</li> </ol> </li> </ol>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>T R A I N I N G</p>	<p>L A B E L I N G</p>	<p>P O S T I N G</p>	<p>P R A C T I C E S</p>	<p>ADDITIONAL INFORMATION</p>
<p>Toluene diisocyanate (continued)</p>			<p>respirator—30 CFR 12 (Bureau of Mines Schedule 13E);</p> <p>c. Self-contained breathing apparatus— 30 CFR 11 (Bureau of Mines Schedule 13E).</p> <p>12. Workers engaged in spraying material containing TDI and others within 10 ft of the spray unit shall wear Type C continuous flow, supplied-air, positive pressure impervious hoods. These shall also be worn in field and construction work where TDI is being used in pour, froth, or insulation operations.</p> <p>13. Gas masks may be used at distances greater than 10 ft from the spray operations if it is shown that TDI concentrations do not exceed 100 times the TWA for continuous work, or 100 times the ceiling limit for work of short duration.</p> <p>14. The employer shall provide respirators in accordance with</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Toluene diisocyanate (continued)</p>			<p>Table I-1 and shall ensure the employee uses them when required.</p> <p>Hygiene practices</p> <p>15. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>
<p>1,1,1-Trichloroethane (NIOSH 76-184, 7/76)</p>	<ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Neurologic system;</li> <li>b. Cardiovascular system;</li> <li>c. Liver;</li> <li>d. Skin condition.</li> </ol> </li> <li>3. Ability to use positive or negative pressure respirator.</li> </ol>	<p><b>Annually, or as DBRP</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 20 yrs after termination of employment for all workers employed in work involving exposure.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
1,1,1-Trichloroethane (NIOSH 76-184, 7/76)	<div>1. Ceiling limit for 15 min: 1,910 (350).</div> <div>2. Procedures for sampling, and analysis of workroom air shall be as provided in Appendices I and II, or by any method shown to be at least equivalent.</div>	<div>Industrial hygiene survey</div> <div>1. Workers are not considered to be occupationally exposed to 1,1,1-trichloroethane if environmental concentrations, as determined on the basis of an IH survey, do not exceed the action level, or if there is no operation, storage, or handling of 1,1,1-trichloroethane in any form, or contamination of workplace air by 1,1,1-trichloroethane from other sources.</div> <div>2. These IH surveys shall be repeated at least every 3 yrs and within 30 days after any process or operation change likely to result in increases of airborne concentrations of 1,1,1-trichloroethane.</div> <div>Personal monitoring</div> <div>3. Where the action level is exceeded, a program of personal monitoring shall be instituted to identify and measure the exposure of all employees occupationally exposed to 1,1,1-trichloroethane.</div>	<div>Protective clothing</div> <div>1. In any operation where the worker may come into direct contact with liquid 1,1,1-trichloroethane, protective clothing shall be worn.</div> <div>2. The clothing should be resistant to 1,1,1-trichloroethane.</div> <div>3. Gloves, boots, overshoes, and bib-type aprons that cover boot tops shall be provided when necessary.</div> <div>4. Impervious supplied-air hoods or suits shall be worn when entering confined spaces such as pits or tanks unless known to be safe.</div> <div>5. In situations where heat stress is likely to occur, air-supplied suits shall be used.</div> <div>6. All protective clothing shall be well-aired and inspected for defects prior to reuse.</div> <div>7. Hands placed in liquid 1,1,1-trichloroethane shall be protected by impervious gloves.</div>	<div>1. IH survey records shall be maintained until the next survey has been completed.</div> <div>2. Environmental monitoring records shall be maintained for at least 20 yrs.</div> <div>3. These records shall include methods of sampling and analysis used, types of respiratory protection used, and TWA and ceiling concentrations found.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div>	Yes		Yes	Yes	<div>1. Occupational exposure = exposure to 1, 1, 1-trichloroethane above 200 ppm as measured as a TWA.</div>



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
1,1,1-Trichloroethane (continued)		<p>4. This sampling and analysis shall be conducted every 3 mos on at least 25% of the workers so that each worker's exposure is measured at least every yr; this frequency and percentage of employees sampled may be different if so directed by a PIH.</p> <p>5. If monitoring of any worker shows exposure in excess of the recommended environmental limit, additional monitoring shall be promptly initiated.</p> <p>6. If confirmed, control procedures shall be instituted as soon as possible; these may precede and obviate confirmatory monitoring if the employer desires. Affected employees shall be advised that exposures have been excessive and be notified of the control procedures being implemented. Monitoring of these employees shall be conducted at least as often as every 30 days and shall continue until 2 successive samplings at least 1 wk apart confirm that exposure no longer exceeds</p>	<p>8. Any liquid 1,1,1-trichloroethane that contacts the skin should be promptly removed.</p> <p><b>Eye protection</b></p> <p>9. Eye protection shall be provided for, and worn by, any employee engaged in an operation where 1,1,1-trichloroethane liquid or spray may enter the eye.</p> <p>10. Chemical-type goggles or safety glasses with splash shields made completely of 1,1,1-trichloroethane-resistant materials shall be used.</p> <p><b>Respiratory protection</b></p> <p>11. When respirators are required, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</p> <p>12. Chemical cartridges and canisters shall not be used for periods of time in excess of those indicated in Table I-1. In any case chemical cartridges and canisters should be replaced after each day of use.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>1,1,1-Trichloroethane</b> (continued)		recommended levels. Normal monitoring may then be resumed.	<p>13. Where an emergency may develop that could result in employee injury from overexposure to 1,1,1-trichloroethane, the employer shall provide respiratory protection as listed in Table I-1.</p> <p><b>Hygiene practices</b></p> <p>14. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Trichloroethylene (NIOSH 73-11025, 1973)	<ol style="list-style-type: none"> <li>Comprehensive medical history, with attn to: <ol style="list-style-type: none"> <li>Headache, nausea, and dizziness;</li> <li>Complaints and evidence of irritations in: <ol style="list-style-type: none"> <li>Eyes;</li> <li>Mucous membranes;</li> <li>Skin;</li> </ol> </li> <li>Ophthalmic exam to those complaining of chronic eye irritation.</li> </ol> </li> <li>Comprehensive physical exam, emphasizing: <ol style="list-style-type: none"> <li>Cardiac system;</li> <li>Pulmonary system;</li> <li>Liver;</li> <li>Kidneys.</li> </ol> </li> </ol>	<b>Annually</b> <ol style="list-style-type: none"> <li>Not specified; presumably, same as in A.</li> </ol>	<ol style="list-style-type: none"> <li>Retain 10 yrs after last occupational exposure for all employees exposed.</li> <li>Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Trichloroethylene (NIOSH 73-11025, 1973)	<ol style="list-style-type: none"><li>1. TWA as measured by a minimum sampling time of 10 min: (100).</li><li>2. Ceiling limit for 10 min: (150).</li><li>3. Procedures for collection of environmental samples shall be as provided in Appendix I, or by an equivalent method. Analysis of samples shall be as provided in Appendix II, or by any method shown to be equivalent in precision, sensitivity, and accuracy to the method specified.</li></ol>	<ol style="list-style-type: none"><li>1. Workroom air where it has been determined, on the basis of an IH survey or the judgment of a compliance officer, that environmental levels of trichloroethylene are less than 1/2 the TWA limit shall not be considered to have trichloroethylene exposure.</li><li>2. Where trichloroethylene exposures are found, sampling shall be conducted in the breathing zone of representative employees at least annually for specific work operations.</li><li>3. Sampling shall also be done whenever process, worksite, climate, or control changes occur which are likely to affect the concentrations of airborne trichloroethylene.</li><li>4. Samples shall be collected and evaluated for both TWA and ceiling values.</li><li>5. The following number of breathing-zone samples shall be collected and analyzed, as a minimum, based on the number of workers exposed in any trichloroethylene exposure area:</li></ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"><li>1. Protective clothing is normally not required for most operations using trichloroethylene.</li><li>2. Operations where splashing, spilling, spraying, etc., or skin contact with trichloroethylene may occur, require special protective clothing. Those working in such operations shall use protective clothing made of polymer impervious to trichloroethylene, such as neoprene.</li><li>3. For any operation that necessitates skin exposure to trichloroethylene, the employee shall be provided gloves with gauntlets and bib-type apron and/or protective clothing made of a material impervious to trichloroethylene.</li><li>4. Aprons shall be of the bib type and extend below the boot top.</li><li>5. Shoes shall be of neoprene or covered by overshoes (disposable)</li></ol>	<ol style="list-style-type: none"><li>1. IH survey records shall be kept.</li><li>2. Records shall be maintained for 10 yrs for all sampling schedules.</li><li>3. Includes the sampling and analytical methods used, the type of respiratory protection in use, and the concentrations found in each work area.</li><li>4. Records shall be maintained so that they can be classified by the employee.</li><li>5. Each worker shall have access to the results of samplings as they pertain to his or her occupational exposures.</li></ol>	Yes	Yes	Yes	<ol style="list-style-type: none"><li>1. Occupational exposure = exposure to trichloroethylene at concentrations equal to or greater than 1/2 the TWA.</li></ol>	

# MEDICAL SURVEILLANCE

<p><b>WORK EXPOSURE (REFERENCE AND DATE)</b></p> <p><b>BOLD TYPE FOR OSHA STANDARDS</b></p>	<p><b>A. PRE-PLACEMENT REQUIREMENT</b></p> <p>FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>B. PERIODIC REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>C. RECORDKEEPING REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>	<p><b>D. OTHER REQUIREMENTS</b></p> <p>FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.</p>

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION							
Trichloroethylene (continued)		<table><thead><tr><th>Number of Employees Exposed</th><th>Number of Samples</th></tr></thead><tbody><tr><td>1-20</td><td>5 samples or 50% of the total number of workers, which- ever is greater</td></tr><tr><td>20-100</td><td>10 samples plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 samples plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>6. The sampling regimen shall be conducted every 30 days for work areas or job activities for which the TWA or ceiling concentrations are in excess of the environmental standard. Sampling, monitoring, and recordkeeping provisions of the 30-day schedule shall be required until 2 consecutive 30-day sampling periods have indicated that the concentrations of trichloroethylene are within the permissible limits.</p>	Number of Employees Exposed	Number of Samples	1-20	5 samples or 50% of the total number of workers, which- ever is greater	20-100	10 samples plus 25% of the excess over 20 workers	> 100	30 samples plus 5% of the excess over 100 workers	<p>of a polymer material impervious to trichloroethylene.</p> <p><b>Eye protection</b></p> <p>6. Eye protection shall be provided for any employee working in an operation that might result in liquid getting into the eye.</p> <p>7. Face shields shall be worn with respirators when the operation requires such protection and a spray of trichloroethylene is possible.</p> <p><b>Respiratory protection</b></p> <p>8. Only appropriate respirators shall be provided and used when a variance which allows the use of respirators as a means of controlling exposure for routine operations has been granted, or while action on application for a variance is pending. Respirators shall also be used in nonroutine operations such as a brief exposure to concentrations in excess of the environmental standard as a result of</p>				
Number of Employees Exposed	Number of Samples														
1-20	5 samples or 50% of the total number of workers, which- ever is greater														
20-100	10 samples plus 25% of the excess over 20 workers														
> 100	30 samples plus 5% of the excess over 100 workers														



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Trichloroethylene (continued)			maintenance or repair activities, or in emergency situations.  9. Employees who experience breathing difficulty while wearing a respirator shall be medically examined to determine their ability to wear the respirator.  Hygiene practices 10. Sanitation measures specified.						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Tungsten and cemented tungsten carbide (NIOSH 77-227, 9/77)	<ol style="list-style-type: none"> <li>1. Medical and work histories.</li> <li>2. Physical exam.</li> <li>3. Clinical tests, with attn to: <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. Pulmonary function tests (FVC, FEV1.0).</li> </ol> </li> <li>4. Ability to use positive pressure respirator.</li> </ol>	<p><b>Annually</b></p> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Tungsten and cemented tungsten carbide (NIOSH 77-227, 9/77)	<div>1. TWA (insoluble tungsten): 5.</div> <div>2. TWA (soluble tungsten): 1.</div> <div>3. TWA (dust of cemented tungsten carbide): 0.1 measured as cobalt/cu m.</div> <div>4. TWA (tungsten carbide containing &gt;0.3% nickel): 15 µg of nickel per cu m air.</div> <div>5. Environmental samples shall be collected and analyzed for tungsten as described in Appendices I and II, or for cobalt or nickel, as appropriate. Any methods shown to be at least equivalent in accuracy, precision, and sensitivity to the methods specified may also be used.</div>	<div>Industrial hygiene survey</div> <div>1. Each employer shall conduct an IH survey at each location where tungsten compounds or cemented tungsten carbide are released into the workplace air to determine whether exposure to airborne concentrations of tungsten products is above the respective action levels.</div> <div>2. Surveys shall be repeated at least once every 3 yrs and within 30 days of any process change likely to result in an increase of airborne concentrations of tungsten or its products.</div> <div>Personal monitoring</div> <div>3. If it has been determined that the environmental concentration of tungsten or its products may exceed the appropriate action level or TWA, a program of personal monitoring shall be instituted to identify and measure, or permit calculation of, the exposure of each employee occupationally exposed to any tungsten compound or cemented tungsten carbide.</div>	<div>Protective clothing</div> <div>1. While most workers do not experience skin irritation as a result of exposure to tungsten compounds or cemented tungsten carbide, there are some who develop sensitivity.</div> <div>2. Fingerless gloves may be used during grinding of hard metal to protect the hands from abrasion.</div> <div>3. Protective sleeves of dust-proof material may be worn to prevent impact of hard-metal dust on the skin of the arms.</div> <div>4. In the absence of such gloves and sleeves, creams protective against abrasion may be applied liberally to the hands and arms to minimize contact of the skin with hard-metal dust.</div> <div>5. When skin irritation occurs, these workers should be referred to a physician for appropriate protective and therapeutic measures.</div> <div>6. When abrasive dust of tungsten carbide is likely to contact major parts of an employee's body, the employee should wear</div>	<div>1. IH survey records shall be kept.</div> <div>2. Employers or their successors shall retain records of environmental monitoring for each employee for at least 30 yrs after the individual's employment has ended.</div> <div>3. These records shall include the name and SSN of the employee being monitored; job function and location within the worksite at the time of sampling; dates of measurements; sampling and analytical methods used and evidence for their accuracy; number, duration, and results of samples taken and TWA concentrations based on these samples; and the type of personal protective equipment in use, if any.</div> <div>4. Records for each employee, indicating the dates of employment with the company and changes in job assignment, shall be kept for the same 30-yr period.</div> <div>5. These records shall be made available to DR of the Sec. of HHS and of the Sec. of Labor.</div>	Yes		Yes	Yes	<div>1. Occupational exposure = exposure to cemented tungsten carbide, elemental tungsten, or its compounds at concentrations greater than the appropriate action level. Cemented tungsten products in which nickel is the binder are an exception. Here, the NIOSH definition of occupational exposure to nickel shall apply.</div> <div>2. Action level = 1/2 the appropriate recommended TWA.</div>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Tungsten and cemented tungsten carbide (continued)		<p>4. Source and area monitoring may be used to supplement personal monitoring.</p> <p>5. If an employee is found to be exposed above the appropriate TWA concentration limit, the exposure of that employee shall be measured at least once every 30 days, and control measures shall be initiated; the employee and others who work in the area while controls are being installed shall be notified of the exposure and of the control measures being implemented. Monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental concentration limit; quarterly or triennial monitoring as applicable may then be resumed.</p> <p>6. If an employee is found to be exposed above the appropriate action level, the exposure of that employee shall be monitored at least once</p>	<p>closely woven coveralls provided by the employer. The coveralls should be laundered frequently to minimize mechanical irritation from dust in the cloth.</p> <p><b>Eye protection</b></p> <p>7. Eye protection shall be provided for operations such as grinding, which produce and scatter particulates into the air.</p> <p><b>Respiratory protection</b></p> <p>8. When permissible, the employer shall provide respirators in accordance with Tables I-1, I-2, and I-3 and shall ensure that employees use the respirators provided.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>	6. Employees or former employees shall have access to information on their own exposures.					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Tungsten and cemented tungsten carbide (continued)</b>		<p>every 3 mos until the measured concentration is found to be below the action level in 2 successive analyses of samples taken at least 1 wk apart.</p> <p>7. The employees or their DR shall be given the opportunity to observe any measurement conducted, and to receive a full explanation of the significance of the measurements.</p>							



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Ultraviolet radiation (NIOSH 73-11009, 12/72)	<ol style="list-style-type: none"> <li>1. Medical history, with attn to any condition exacerbated or aggravated by exposure to sunlight.</li> <li>2. Any blemishes appearing on exposed skin when examined by physician.</li> </ol>	Not mentioned	No requirements specified.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Ultraviolet radiation (NIOSH 73-11009, 12/72)	<div>1. For ultraviolet spectral region 315-400 nm, total irradiance on unprotected skin/eyes shall not exceed 1.0 mW/cm<sup>2</sup> for periods greater than 1,000 sec, and for exposure times of 1,000 sec or less, the total radiant energy shall not exceed 1,000 mWsec/cm<sup>2</sup> (1.0 J/cm<sup>2</sup>).</div> <div>2. 200-315 nm: If from a narrow-band or monochromatic source, see Table I-1 or Figure I-1. For a broad-band source, the effective irradiance (I<sub>eff</sub>) relative to a 270-nm monochromatic source shall be calculated</div>	Sufficient technology exists to prevent adverse effects on workers, but technology to measure UV energy for compliance with the recommended standard is not adequate, so work practices are recommended for control of exposure in cases where sufficient measurement or emission data are not available.	<div>1. Skin protection from sunlight:<div>a. Long-sleeved shirts, trousers or skirt, broad-brimmed hat, and neck shield will normally be adequate. Hard hats may have bills or face shields to protect the face, and may have neck shields;</div><div>b. Barrier creams will provide alternate face and eye protection.</div></div> <div>2. Eye protection from sunlight can be afforded by goggles or spectacles.</div> <div>3. Skin protection from low-intensity UV sources (sunlamps, black-light lamps, and low-pressure mercury vapor lamps):<div>a. Light-weight clothing provides adequate protection;</div><div>b. Absorbing skin creams containing benzophenones or p-amino benzoic acid, as well as barrier creams containing titanium dioxide or zinc oxide may also be used.</div></div> <div>4. Eye protection from low-intensity UV sources:</div>	<div>1. Because measurement of exposure of workers to UV energy is not required, records are not required.</div>	No	Yes	Yes		

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<p>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</p>	<p>ENVIRONMENTAL STANDARD mg/m<sup>3</sup> (ppm)</p>	<p>MONITORING REQUIREMENTS</p>	<p>PERSONAL PROTECTIVE REQUIREMENTS</p>	<p>RECORDKEEPING REQUIREMENTS</p>	<p>TRAINING</p>	<p>LABELLING POSTING</p>	<p>PRACTICES WORK</p>	<p>ADDITIONAL INFORMATION</p>
<p>Ultraviolet radiation (continued)</p>	<p>from the following formula:</p> $I_{eff} = \sum I_{\lambda} S_{\lambda} \Delta_{\lambda}$ <p>where</p> <p><math>I_{eff}</math> = effective irradiance relative to a monochromatic source at 270 nm</p> <p><math>I_{\lambda}</math> = spectral irradiance in W/cm<sup>2</sup>/nm</p> <p><math>S_{\lambda}</math> = relative spectral effectiveness (unitless); Table I-1 gives values of <math>S_{\lambda}</math> at different wavelengths</p> <p><math>\Delta_{\lambda}</math> = band width in nm</p> <p>3. From <math>I_{eff}</math>, the PEL in sec for unprotected skin or eyes shall be computed by dividing 0.003 J/cm<sup>2</sup>, the permissible dose of 270 nm radiation, by <math>I_{eff}</math> in W/cm<sup>2</sup>. Table I-2 lists permissible exposure times corresponding to selected values of <math>I_{eff}</math> in <math>\mu</math>W/cm<sup>2</sup>.</p>		<p>a. Glass/plastic spectacles (1/8-in thickness or greater) provide adequate protection; b. Goggles or shields may also be used.</p> <p>5. Skin protection from high-intensity UV sources (carbon arcs, plasma torches, high-pressure mercury vapor lamps, and xenon arcs):</p> <p>a. Clothing of densely woven flannelette, poplin, or synthetic fibers will give sufficient protection;</p> <p>b. Facial skin can be protected by face shields of shades specified in ANSI Z49.1 or by barrier creams containing titanium dioxide or zinc oxide;</p> <p>c. Clothing of synthetic fibers should be flame-resistant if operations involve great heat, sparks, or flame;</p> <p>d. Shielding (such as a welder's booth) and non-reflective surfaces should be used to guard</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Ultraviolet radiation (continued)</b>			<p>against accidental exposure of other people in a welding operation area. If these are not used, protective clothing, skin creams, gloves, goggles, or face shields should be used.</p> <p>6. Eye protection from high-intensity UV sources:</p> <ul style="list-style-type: none"> <li>a. Goggles, face shields, or masks shall be used;</li> <li>b. For shade required for these, consult Section 7 of ANSI Z49.1-1967;</li> <li>c. Eye protection must be used at all times when the arc is operating. If necessary in order to see the operation, Shade 8 may be used in place of a shade of greater absorbence.</li> </ul> <p>7. A shock hazard must be prevented by wearing gloves and face shields when operating arcs. Wearing these also will reduce the consequences of an explosion.</p>						

# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Vanadium (NIOSH 77-222, 8/77)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, emphasizing evidence of: <ol style="list-style-type: none"> <li>a. Chronic eye/skin disorders;</li> <li>b. Respiratory conditions;</li> <li>c. Allergies.</li> </ol> </li> <li>2. Physical exam, with attn to: <ol style="list-style-type: none"> <li>a. Upper respiratory tract;</li> <li>b. Eyes.</li> </ol> </li> <li>3. Clinical tests: <ol style="list-style-type: none"> <li>a. 14" x 17" post/ant chest X-ray;</li> <li>b. FEV1.0 and FVC, at least.</li> </ol> </li> <li>4. Ability to use negative or positive pressure respirator.</li> </ol>	<b>Annually, or as DBRP</b> <ol style="list-style-type: none"> <li>1. Same as in A.1, 2, and 3.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 30 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHR, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Vanadium (NIOSH 77-222, 8/77)	<div>1. Ceiling limit for 15 min for vanadium compound: 0.05.</div> <div>2. TWA for metallic vanadium: 1.0.</div> <div>3. Environmental samples shall be collected and analyzed as described in Appendices I and II, or by any method at least equivalent in accuracy, precision, and sensitivity.</div>	<div>Industrial hygiene survey</div> <div>1. Employers shall conduct an IH survey at locations where there is vanadium in the workplace air to determine if there is exposure to airborne vanadium at concentrations greater than the action level.</div> <div>2. Surveys shall be repeated at least annually and within 30 days of any change likely to result in increased concentrations of airborne vanadium.</div> <div>Personal monitoring</div> <div>3. If it has been determined that the environmental concentration of vanadium exceeds the action level, a program of personal monitoring shall be instituted to identify and measure, or permit calculation of, the exposure of each employee occupationally exposed to vanadium.</div> <div>4. Source and area monitoring may be used to supplement personal monitoring.</div> <div>5. Each operation in each work area shall be sampled at least once every 6 mos</div>	<div>Protective clothing</div> <div>1. The employer shall provide protective clothing and equipment resistant to the penetration of vandium when necessary to prevent gross skin and eye contact with liquid vanadium compounds or vanadium solutions.</div> <div>2. The employer shall provide appropriate clothing and equipment, including gloves, aprons, suits, boots, or face shields and goggles, and shall ensure that employees wear these where needed to prevent gross skin and eye contact.</div> <div>Eye protection</div> <div>3. The employer shall provide chemical safety goggles or face shields (8 in minimum) with goggles and shall ensure that employees wear the protective equipment during any operation in which vanadium may enter the eyes.</div> <div>Respiratory protection</div> <div>4. Compliance with the permissible exposure limits by the use of respirators is permitted only during</div>	<div>1. IH survey records shall be kept.</div> <div>2. Environmental monitoring records shall be maintained for at least 30 yrs.</div> <div>3. These records shall include the name of the employee being monitored; duties performed and job locations within the worksite; date of measurements; sampling and analytical methods used; the number, duration, and results of samples taken;TWA and ceiling concentrations estimated from these samples; and the type of personal protection used, if any, by the employee.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div> <div>5. Environmental records shall be made available to DR of the Sec. of Labor and of the Sec. of HHS.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = exposure to airborne vanadium above the action level.</div> <div>2. Action level = the PEL for that form of vanadium.</div>	



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD  mg/m<sup>3</sup> (ppm)</b>	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G  P O S T I N G</b>	<b>P R A C T I C E S  W O R K</b>	<b>ADDITIONAL INFORMATION</b>
<b>Vanadium (continued)</b>		<p>or as otherwise indicated by a PIH.</p> <p>6. If an employee is found to be exposed to vanadium at concentrations above the PEL, the exposure of that employee shall be measured at least once every wk, control measures shall be initiated, and the employee shall be notified of the exposure and of the control measures being implemented. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure no longer exceeds the recommended environmental limit. At that point, semiannual monitoring may be resumed.</p>	<p>installation and testing of engineering controls, during performance of nonroutine maintenance or repair, when working in confined spaces, or during emergencies.</p> <p>5. The employer shall provide respirators in accordance with Tables I-1 and I-2 and shall ensure that the employees properly use the respirators provided when wearing respirators is required.</p> <p>6. The employer shall periodically monitor the use of respirators to ensure that the proper type of respirator is worn, to evaluate the effectiveness of the respiratory protection program, and to eliminate any deficiencies in use and care of respirators.</p> <p>7. Respirators shall be easily accessible, and employees shall be informed of their location.</p> <p>8. Protective equipment suitable for emergency use shall be located at clearly identified stations outside the work area.</p> <p><b>Hygiene practices</b></p> <p>9. Sanitation measures specified.</p>					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Vinyl acetate (NIOSH 78-205, 9/78)	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with attn to pre-existing disorders of:               <ol style="list-style-type: none"> <li>a. Eyes;</li> <li>b. Respiratory system;</li> <li>c. Skin.</li> </ol> </li> <li>2. Physical exam, with attn to:               <ol style="list-style-type: none"> <li>a. Upper respiratory tract;</li> <li>b. Skin;</li> <li>c. Eyes.</li> </ol> </li> <li>3. Ability to use positive pressure respirator.</li> </ol>	<b>Annually</b> <ol style="list-style-type: none"> <li>1. Same as in A.1 and 2.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain 30 yrs after termination of employment for all employees exposed.</li> <li>2. Include environmental exposure records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Vinyl acetate (NIOSH 78-206, 9/78)	<div>1. Ceiling limit for 15 min: 15 (4).</div> <div>2. Workroom air samples shall be collected and analyzed as described in Appendix I, or by any other methods at least equivalent in accuracy, precision, and sensitivity.</div>	<div>Industrial hygiene survey</div> <div>1. Employers shall determine by IH survey whether there is exposure to airborne vinyl acetate at concentrations greater than 1/2 the recommended ceiling limit.</div> <div>2. Surveys shall be repeated at least annually and as soon as possible after any process change likely to result in increased concentrations of airborne vinyl acetate in the workplace.</div> <div>Personal monitoring</div> <div>3. If it is determined that concentrations of airborne vinyl acetate are above 1/2 of the recommended ceiling limit, a program of personal monitoring shall be instituted to identify and measure or permit calculation of the exposure of each employee subject to exposure to vinyl acetate. Source and area monitoring may be used to supplement personal monitoring.</div> <div>4. Each operation in each work area shall be sampled</div>	<div>Protective clothing</div> <div>1. Employees shall wear appropriate protective clothing, including gloves, aprons, suits, and boots when needed to prevent skin contact with liquid vinyl acetate.</div> <div>Eye protection</div> <div>2. Employers shall provide chemical safety goggles or face shields (8 in minimum) with goggles and shall ensure that employees wear this protective equipment during any operation in which there is the likelihood of exposure to liquid vinyl acetate.</div> <div>Respiratory protection</div> <div>3. The use of respirators to achieve compliance with the recommended exposure limit is permitted only during the time required to install or test necessary engineering controls, during performance of nonroutine maintenance or repair activities, during work in confined spaces, and during emergencies when the concentration of</div>	<div>1. IH survey records shall be kept.</div> <div>2. Records of environmental monitoring for each employee shall be retained for at least 30 yrs after the individual's employment has ended.</div> <div>3. These records shall include the name of the employee being monitored; duties performed and job locations within the worksite; dates and times of measurements; sampling and analytical methods used; number, duration, and results of samples taken; concentrations of airborne vinyl acetate estimated from the samples; and the type of personal protection used, if any.</div> <div>4. Each employee shall be able to obtain information on his or her own environmental exposures.</div> <div>5. These records shall be made available upon request to DR of the Sec. of Labor, of the Sec. of HHS, and of the employee or former employee.</div>	Yes	Yes	Yes	<div>1. Occupational exposure = exposure to airborne vinyl acetate at concentrations above 1/2 the PEL.</div>	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS); OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Vinyl acetate (continued)		<p>at least once every 6 mos, or as otherwise indicated by a PIH.</p> <p>5. If an employee is found to be exposed to vinyl acetate at concentrations above the recommended ceiling limit, control measures shall be initiated, the employee shall be notified of the exposure and of the control measures being implemented, and the exposure of the employee shall be measured at least once every wk. Such monitoring shall continue until 2 consecutive determinations, at least 1 wk apart, indicate that the employee's exposure is no longer in excess of the recommended limit. At that point, semiannual monitoring may be resumed.</p> <p>6. If semiannual monitoring indicates that the employee's exposure no longer exceeds 1/2 of the recommended ceiling limit, personal monitoring may be discontinued.</p>	<p>airborne vinyl acetate may exceed the recommended PEL.</p> <p>4. Employers shall provide respirators in accordance with Table I-1 and shall ensure that employees use the respirators provided when necessary.</p> <p>5. Employers shall ensure that respirators are adequately cleaned and maintained and that employees are instructed and drilled at least annually in the proper use and testing for leakage of respirators assigned to them.</p> <p>6. Respirators shall be easily accessible, and employees shall be informed of their locations.</p> <p><b>Hygiene practices</b></p> <p>7. Sanitation measures specified.</p>						

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Vinyl chloride</b> <b>(1910.1017, 11/78)</b>	<ol style="list-style-type: none"> <li>1. Medical/personal history:               <ol style="list-style-type: none"> <li>a. Alcohol intake;</li> <li>b. Past history of hepatitis;</li> <li>c. Blood transfusions and hospitalization.</li> </ol> </li> <li>2. Work history and past exposure to potential hematotoxic agents including drugs and chemicals.</li> <li>3. Physical exam, with attn to enlargements or dysfunctions of:               <ol style="list-style-type: none"> <li>a. Liver;</li> <li>b. Spleen;</li> <li>c. Kidneys;</li> </ol>               Also, with attn to abnormalities in:               <ol style="list-style-type: none"> <li>d. Skin;</li> <li>e. Connective tissue;</li> <li>f. Pulmonary system.</li> </ol> </li> <li>4. Tests:               <ol style="list-style-type: none"> <li>a. Urinalysis (red blood cells, albumin);</li> <li>b. FEV1.0 and FVC;</li> <li>c. 14" x 17" post/ant chest X-ray;</li> <li>d. Additional serum tests.</li> </ol> </li> </ol>	<b>Semi-annually</b> <ol style="list-style-type: none"> <li>1. For those exposed &gt; 10 yrs.</li> <li>2. Content not specified.</li> </ol> <b>Annually</b> <ol style="list-style-type: none"> <li>3. For all others.</li> <li>4. Content not specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the duration of employment plus 20 yrs or for 30 yrs, whichever is longer, for all employees exposed without regard to the use of respirators.</li> <li>2. Shall be provided upon request to employees, DMR, the Assistant Sec., and the Director.</li> <li>3. In the event that the employer ceases business without a successor, transmit all records by registered mail to the Director and notify each employee individually in writing of this transfer.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Vinyl chloride (1910.1017)	1. TWA: (1). 2. Ceiling limit for 15 min: (5). 3. There shall be no exposure by direct contact with liquid vinyl chloride.	1. A program of initial monitoring and measurement shall be taken in each establishment to determine if there is any employee exposed, without regard to the use of respirators, in excess of the action level. 2. Where employee exposure is found in excess of the action level, a program for determining exposures for each such employee shall be established. 3. Monitoring shall be repeated at least monthly where any employee is exposed in excess of the PEL. 4. Monitoring shall be repeated not less than quarterly where any employee is exposed in excess of the action level. 5. Monitoring may be discontinued for any employee only when at least 2 consecutive monitoring determinations, made not less than 5 working days apart, show exposures for that employee at or below the action level.	<b>Protective clothing</b> 1. Protective garments shall be selected for the operation and its possible exposure conditions. 2. Protective garments shall be provided clean and dry for each use. <b>Respiratory protection</b> 3. Respirators shall be selected from among those jointly approved by MSHA, the Department of Interior, and NIOSH under the provisions of 30 CFR Part 11. 4. A respiratory protection program meeting the requirements of § 1910.134 shall be established and maintained. 5. Entry into unknown concentrations or concentrations greater than 35,000 ppm (lower explosive limit) may be made only for purposes of life rescue. 6. Entry into concentrations of less than 36,000 ppm, but greater than 3,600 ppm may be made only for purposes of life rescue, firefighting, or securing	1. All records shall include the name and SSN of each employee. 2. Records shall be provided upon request to employees, DR, and the Assistant Sec. These records shall also be provided upon request to the Director. 3. Authorized personnel rosters shall also be provided upon request to the Assistant Sec. and the Director. 4. Monitoring and measuring records shall: a. State the date of such monitoring and measuring and the concentrations determined, and identify the instruments and methods used; b. Include any additional information necessary to determine individual employee exposure where such exposures are determined by means of other than individual monitoring of employees; and	Yes	Yes	Yes	1. Action level = a concentration of vinyl chloride of 0.5 ppm averaged over an 8-hr workday.	



# MEDICAL SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	A. PRE-PLACEMENT REQUIREMENT  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	B. PERIODIC REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	C. RECORDKEEPING REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	D. OTHER REQUIREMENTS  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Vinyl chloride (continued)	5. Serum specimens: a. Total bilirubin; b. Alkaline phosphatase; c. SGOT and SGPT; d. Gamma glustamyl transpeptidase.			

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
SSAN = SOCIAL SECURITY NUMBER  
DMR = DESIGNATED MEDICAL REPRESENTATIVE  
HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Vinyl chloride (continued)</b>		6. Whenever there has been a production, process, or control change which may result in an increase in the release of vinyl chloride, or the employer has any other reason to suspect that an employee may be exposed in excess of the action level, a determination of employee exposure shall be performed.  7. The method of monitoring and measurement shall have an accuracy (with a confidence level of 95%) of not less than ± 50% from 0.25 through 0.5 ppm, ± 35% from over 0.5 ppm through 1.0 ppm, and ± 25% over 1.0 ppm.  8. Employees or their DR shall be afforded reasonable opportunity to observe the monitoring and measuring required.  9. A regulated area shall be established where vinyl chloride or polyvinyl chloride is manufactured, reacted, repackaged,	equipment so as to prevent a greater hazard from release of vinyl chloride.  7. Where air-purifying respirators are used: a. Air-purifying canisters or cartridges shall be replaced prior to the expiration of their service life or the end of the shift in which they are first used, whichever occurs first; and  b. A continuous monitoring and alarm system shall be provided where concentrations of vinyl chloride could reasonably exceed the allowable concentrations for the devices in use. Such systems shall be used to alert employees when vinyl chloride concentrations exceed the allowable concentrations for the devices in use.  8. Apparatus prescribed for higher concentrations may be used for any lower concentration.	c. Be maintained for not less than 30 yrs.  5. In the event that the employer ceases to do business and there is no successor to receive and retain his records for the prescribed period, these records shall be transmitted by registered mail to the Director and each employee individually notified in writing of this transfer.					

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Vinyl chloride (continued)</b>		<p>stored, handled, or used; and when concentrations are in excess of the PEL.</p> <p>10. Access to regulated areas shall be limited to authorized persons.</p> <p>11. Within 10 working days following any monitoring and measuring which discloses that any employee has been exposed, without regard to the use of respirators, in excess of the PEL, each such employee shall be notified in writing of the results of the exposure measurement and the steps being taken to reduce the exposure to within the PEL.</p> <p>12. Not later than 1 mo after the establishment of a regulated area, the following information shall be reported to the OSHA Area Director. Any changes to such information shall be reported within 15 days.</p> <p>a. The address and location of each establishment which has 1 or more regulated areas; and</p>							

## MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

## WORKPLACE SURVEILLANCE

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
Vinyl chloride (continued)		<p>b. The number of employees in each regulated area during normal operations, including maintenance.</p> <p>13. Emergencies, and the facts obtainable at that time, shall be reported within 24 hrs to the OSHA Area Director. Upon request of the Area Director, the employer shall submit additional information in writing relevant to the nature and extent of employee exposures and measures taken to prevent future emergencies of similar nature.</p>							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Waste anesthetic gases and vapors</b> <b>(NIOSH 77-140, 3/77)</b>	<ol style="list-style-type: none"> <li>1. Comprehensive medical and work histories, with attn to:               <ol style="list-style-type: none"> <li>a. Outcome of pregnancy (for employee or spouse);</li> <li>b. Hepatic system;</li> <li>c. Renal system;</li> <li>d. Hematopoietic systems.</li> </ol> </li> <li>2. Physical exam.</li> </ol>	<b>Annually</b> <ol style="list-style-type: none"> <li>1. Physical exam.</li> <li>2. Documentation of abnormal outcome of pregnancy.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain for the period of employment plus 20 yrs after termination of employment or termination of work of a self-employed person for all employees subject to exposure.</li> <li>2. Any abnormal outcome of pregnancies of employees or spouses exposed shall be documented in records.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Waste anesthetic gases and vapors (NIOSH 77-140, 3/77)	<div>1. Halogenated anesthetic agents: ceiling limit for 1 hr based on weight of agent: (2).</div> <div>2. Agents to be controlled with their respective weights cor- responding to 2 ppm: chloro- form: 9.76; trichloro- ethylene: 10.75; halothane: 16.15; methoxy- flurane: 13.5; enflurane: 15.1; fluoroxene: 10.31.</div> <div>3. When used in combination with nitrous oxide, levels of agent below 2 ppm are achievable.</div> <div>4. Nitrous oxide alone: TWA: (25).</div>	<div>1. The monitoring program shall be supervised by a knowledgeable individual familiar with sampling and monitoring techniques or by a PIH.</div> <div>2. The agent to be monitored and the method chosen will depend on the frequency of the agent's use, availability of sampling and analysis instrumen- tation, and on whether the facility chooses to initiate its own monitoring program or take advantage of a commercial service.</div> <div>3. Sampling shall be conducted in areas that are representative of the concentrations at which workers are exposed during routine pro- cedures, incorporating any inhalation anesthetic.</div> <div>4. Sampling sites shall be chosen by surveying each location to which the standard applies to determine typical waste anesthetic gas distri- bution patterns, or shall be representative of the breathing zone of the exposed workers.</div>	<div>Hygiene practices</div> <div>1. Sanitation measures specified.</div>	<div>1. Records of all collected air samples shall be maintained including date of sample, sampling methods, sample location, analytical method, and measured concentrations.</div> <div>2. Corrective actions taken when waste anesthetic gas levels are found above the recommended PEL shall be recorded.</div> <div>3. Results of environmental measurements shall be made available to exposed employees upon request.</div> <div>4. Air sampling results and results of leak tests shall be maintained for at least 20 yrs.</div>	Yes	Yes	Yes		



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
<b>Waste anesthetic gases and vapors (continued)</b>	5. Procedures for sampling and analysis of air in exposure areas shall be as provided in Appendices II-IV, or by any methods equivalent in sensitivity, accuracy, and precision.	5. For purposes of air monitoring, the inhalation anesthetic agent most frequently used must be chosen for sampling and analysis.  6. Sampling shall be conducted during periods of anesthetic administration, and should not exceed 1 hr.  7. Repetitive sampling shall be conducted quarterly in locations which inhalation anesthetic agents are used, and whenever ventilation, anesthetic equipment, or scavenging techniques are modified.  8. As soon as practicable after promulgation of a standard, anesthetic delivery systems shall be equipped for scavenging waste anesthetic gases.  9. Within 180 days after promulgation of a standard, and quarterly thereafter, equipment for administering anesthetic gas levels shall be tested to ensure the low-pressure leak rate is less than 100 mL/min at 30 cm H <sub>2</sub> O pressure, and during the							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES	ADDITIONAL INFORMATION
Waste anesthetic gases and vapors (continued)		quarter less than 1ℓ/min at 30 cm H <sub>2</sub> O pressure.  10. Mechanical ventilators shall also be tested quarterly.  11. Low-pressure leak tests shall be performed daily for the complete anesthetic machine. If greater than 100 ml/min at 30 cm H <sub>2</sub> O pressure, the leak shall be found and repaired before use of the equipment.							

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
<b>Xylene</b> <b>(NIOSH 75-168, 5/75)</b>	1. Comprehensive medical and work histories, with attn to: a. Incidence of headache, nausea, and other gastrointestinal disturbances; b. Alcohol consumption; c. Dizziness; d. Complaints and evidence of irritation in: i. Eyes; ii. Mucous membranes; iii. Skin. 2. Lab tests: a. Complete blood count; b. Liver function tests; c. Urinalysis.	<b>Biennially</b> 1. Same as in A.	No requirements specified.	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	T R A I N I N G	L A B E L I N G	P O S T I N G	P R A C T I C E S	ADDITIONAL INFORMATION
Xylene (NIOSH 75-168, 5/75)	1. TWA: ~434 (100).  2. Ceiling limit for 10 min: ~868 (200).  3. Procedures for collection and analysis of environmental samples shall be as provided in Appendices I and II, or by any other method shown to be equivalent in accuracy, precision, and sensitivity.	1. Workroom areas shall not be considered to have xylene exposure if environmental levels, as determined on the basis of a professional IH survey or by the judgment of the compliance officer, do not exceed 1/2 of the recom- mended TWA limit.  2. Surveys shall be repeated when any process change indicates a need for reevaluation or at the judgment of the compliance officer.  3. For areas in which there is xylene exposure, employers shall conduct environ- mental monitoring.  4. In all monitoring, samples representative of the exposure in the breathing zone of employees shall be collected.  5. An adequate number of samples shall be collected to permit construction of a TWA exposure for every operation or process. The minimum number of representative TWA determinations for an operation or process shall be based on the number	<b>Protective clothing</b>  1. Appropriate protective clothing, including gloves, aprons, suits, boots, or face shields, shall be worn where needed to prevent repeated or prolonged skin contact.  <b>Eye protection</b>  2. Chemical safety goggles, face shields, or safety glasses with side shields shall be provided by the employer and shall be worn in any operation in which xylene may splash into the eyes.  <b>Respiratory protection</b>  3. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.  4. Where an emergency may develop which could result in employee injury from overexposure to xylene, the employer shall provide respiratory protection as listed in Table I-1.  <b>Hygiene practices</b>  5. Sanitation measures specified.	1. IH survey records shall be maintained until a new survey is conducted.  2. Sampling records shall be maintained so that exposure information is available for individual employees and shall indicate the type of personal protective devices, if any, in use at the time of sampling.  3. Each employee shall be able to obtain information on his or her own environmental exposures.	Yes	Yes	Yes	1. Occupational exposure = exposure to xylene above 1/2 the PEL.	

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE)  BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Xylene (continued)		<p>of workers exposed as provided in the table below.</p> <table><thead><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr></thead><tbody><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>6. Environmental samples shall be taken within 30 days after installation of a new process or process change.</p> <p>7. Samples shall be collected at least quarterly in accordance with Appendix 1.</p> <p>8. Environmental monitoring of an operation or process shall be repeated at 30-day intervals when the xylene concentration has been found to exceed the recommended environmental standard. In such cases, suitable controls shall be initiated and monitoring continued until 2 consecutive surveys indicate the adequacy of these controls.</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the total number of workers	21-100	10 plus 25% of the excess over 20 workers	> 100	30 plus 5% of the excess over 100 workers							
Number of Employees Exposed	Number of TWA Determinations																
1-20	50% of the total number of workers																
21-100	10 plus 25% of the excess over 20 workers																
> 100	30 plus 5% of the excess over 100 workers																



# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.
Zinc oxide (NIOSH 76-104, 10/75)	<ol style="list-style-type: none"> <li>1. Comprehensive work and medical histories.</li> <li>2. Physical exam, with emphasis on:               <ol style="list-style-type: none"> <li>a. Respiratory tract, as DBRP;</li> <li>b. Chest X-ray, as DBRP;</li> <li>c. Pulmonary function, as DBRP.</li> </ol> </li> </ol>	<b>As DBRP</b> <ol style="list-style-type: none"> <li>1. Appropriate emergency care.</li> </ol>	<ol style="list-style-type: none"> <li>1. Retain at least 5 yrs after termination of employment for persons employed 1 or more yrs in work involving exposure.</li> <li>2. Include information on all required medical examinations and all reported episodes of metal fume fever.</li> <li>3. Shall be available to DMR of the Sec. of HHS, of the Sec. of Labor, of the employer, and of the employee.</li> </ol>	

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD  mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELLING POSTING	PRACTICES WORK	ADDITIONAL INFORMATION
<b>Zinc oxide</b> <b>(NIOSH 76-104, 10/75)</b>	<ol style="list-style-type: none"> <li>1. TWA: 5.</li> <li>2. Ceiling limit for 15 min: 15.</li> <li>3. Procedures for sampling and analysis of environmental samples shall be as provided in Appendices I and II.</li> </ol>	<ol style="list-style-type: none"> <li>1. Workroom areas shall not be considered to have zinc oxide exposure if environmental levels, as determined on the basis of an IH survey or by the judgment of the compliance officer, do not exceed 1/2 of the recommended TWA limit.</li> <li>2. Workroom areas where there is exposure to zinc oxide shall be monitored.</li> <li>3. Employers shall monitor environmental levels of zinc oxide at least every 6 mos, except as otherwise indicated by a PIH.</li> <li>4. Also, surveys shall be repeated when any change in operations, processes, worksite, climate, or control indicates a need for reevaluation, or at the discretion of the compliance officer.</li> <li>5. Sampling shall take into consideration variations in exposure arising in welding, burning, or related operations because of work on materials having various types of coatings of zinc or zinc compounds.</li> </ol>	<p><b>Protective clothing</b></p> <ol style="list-style-type: none"> <li>1. It is recommended that employees wear coveralls or equivalent clothing during working hours.</li> </ol> <p><b>Respiratory protection</b></p> <ol style="list-style-type: none"> <li>2. When permissible, the employer shall provide respirators in accordance with Table I-1 and shall ensure that the employee uses the respirator provided.</li> </ol> <p><b>Hygiene practices</b></p> <ol style="list-style-type: none"> <li>3. Sanitation measures specified.</li> </ol>	<ol style="list-style-type: none"> <li>1. IH survey records shall be maintained until a new survey is conducted.</li> <li>2. Records of all sampling and of medical examinations shall be maintained for at least 5 yrs after the individual's employment is terminated.</li> <li>3. Records shall indicate the type of respiratory protective devices, if any, in use at the time of sampling.</li> <li>4. Records shall be maintained so that they can be classified to the extent possible by the employee.</li> <li>5. Each employee shall be able to obtain information on his or her own environmental exposures.</li> </ol>	Yes	Yes	Yes	<ol style="list-style-type: none"> <li>1. Occupational exposure = exposure above 1/2 the recommended TWA.</li> </ol>

# MEDICAL SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b>  FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b>  FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP - DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN - SOCIAL SECURITY NUMBER  
 DMR - DESIGNATED MEDICAL REPRESENTATIVE  
 HHS - HEALTH AND HUMAN SERVICES

# **WORKPLACE SURVEILLANCE**

WORK EXPOSURE (REFERENCE AND DATE) BOLD TYPE FOR OSHA STANDARDS	ENVIRONMENTAL STANDARD mg/m <sup>3</sup> (ppm)	MONITORING REQUIREMENTS	PERSONAL PROTECTIVE REQUIREMENTS	RECORDKEEPING REQUIREMENTS	TRAINING	LABELING	POSTING	PRACTICES WORK	ADDITIONAL INFORMATION								
Zinc oxide (continued)		<p>6. Samples shall be collected in the breathing zone of workers.</p> <p>7. The minimum number of representative TWA determinations for an operation or process shall be based on the number of workers exposed as provided in the table below or as otherwise indicated by a PIH.</p> <table><thead><tr><th>Number of Employees Exposed</th><th>Number of TWA Determinations</th></tr></thead><tbody><tr><td>1-20</td><td>50% of the total number of workers</td></tr><tr><td>21-100</td><td>10 samples plus 25% of the excess over 20 workers</td></tr><tr><td>&gt; 100</td><td>30 samples plus 5% of the excess over 100 workers</td></tr></tbody></table> <p>8. If semiannual samples show the environmental concentration of zinc oxide to be in excess of the recommended limits, suitable controls shall be initiated to reduce the exposure level to, or below, the recommended standard. In such cases</p>	Number of Employees Exposed	Number of TWA Determinations	1-20	50% of the total number of workers	21-100	10 samples plus 25% of the excess over 20 workers	> 100	30 samples plus 5% of the excess over 100 workers							
Number of Employees Exposed	Number of TWA Determinations																
1-20	50% of the total number of workers																
21-100	10 samples plus 25% of the excess over 20 workers																
> 100	30 samples plus 5% of the excess over 100 workers																

**MEDICAL SURVEILLANCE**

<b>WORK EXPOSURE (REFERENCE AND DATE)</b>  <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>A. PRE-PLACEMENT REQUIREMENT</b> FOR THOSE WHO WILL BE OR ARE SUB- JECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO WILL BE OR ARE EMPLOYED IN REGULATED AREAS (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>B. PERIODIC REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>C. RECORDKEEPING REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.	<b>D. OTHER REQUIREMENTS</b> FOR THOSE SUBJECT TO OCCUPATIONAL EXPOSURE (FOR RECOMMENDATIONS), OR FOR THOSE WHO ARE AUTHORIZED EMPLOYEES (FOR STANDARDS), UNLESS OTHERWISE STATED.

DBRP = DETERMINED BY RESPONSIBLE PHYSICIAN  
 SSAN = SOCIAL SECURITY NUMBER  
 DMR = DESIGNATED MEDICAL REPRESENTATIVE  
 HHS = HEALTH AND HUMAN SERVICES

# WORKPLACE SURVEILLANCE

<b>WORK EXPOSURE (REFERENCE AND DATE)</b> <b>BOLD TYPE FOR OSHA STANDARDS</b>	<b>ENVIRONMENTAL STANDARD</b> mg/m <sup>3</sup> (ppm)	<b>MONITORING REQUIREMENTS</b>	<b>PERSONAL PROTECTIVE REQUIREMENTS</b>	<b>RECORDKEEPING REQUIREMENTS</b>	<b>T R A I N I N G</b>	<b>L A B E L I N G</b>	<b>P O S T I N G</b>	<b>P R A C T I C E S</b>	<b>ADDITIONAL INFORMATION</b>
Zinc oxide (continued)		monitoring shall continue at 30-day intervals until 2 consecutive surveys indicate the recommended limits are no longer exceeded. Periodic review and evaluation of environ- mental and medical data shall be performed to determine the effectiveness of control measures.							

1. Report No. NASA CR-3690		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle OSHA Medical and Workplace Surveillance Requirements and NIOSH Recommendations				5. Report Date February 1983	
				6. Performing Organization Code NPG-34	
7. Author(s) Linda P. Cooper				8. Performing Organization Report No.	
9. Performing Organization Name and Address  BioTechnology, Inc. Falls Church, Virginia 22042				10. Work Unit No.	
				11. Contract or Grant No. NASW-3510	
12. Sponsoring Agency Name and Address Occupational Health Office National Aeronautics and Space Administration Washington, D.C. 20546				13. Type of Report and Period Covered Contractor Report	
				14. Sponsoring Agency Code	
15. Supplementary Notes  Technical Monitor: Walton L. Jones, M.D.					
16. Abstract <p>As public concern over employee health and safety has grown, so have the regulations and guidelines designed to protect the worker. This is particularly true with respect to hazardous substances. The list of toxic substances is extensive, and having readily accessible information about each material is becoming more and more difficult.</p> <p>This document was prepared to be a desk reference to help occupational health professionals perform their duties. It encompasses both OSHA medical and workplace surveillance requirements and NIOSH recommendations. The medical surveillance information focuses on frequency of physical examinations, specific problems that may arise as a result of exposure (e.g., decreased immunocompetence, weight loss, etc.), conditions that may intensify the harmful effects of exposure (e.g., medication an exposed employee may be taking, cigarette smoking, etc.), the areas that should be scrutinized in medical and work histories and during the physical exam, and specific clinical tests that should be conducted. Recordkeeping requirements are also specified.</p> <p>The workplace surveillance information consists of monitoring requirements, personal protective equipment requirements, and recordkeeping requirements. Such details as the sampling devices that should be used, the type of respirators that should be worn, and the frequency of inspections are included. This document does not specify the training, labeling and posting, and safe work practice requirements and recommendations due to space considerations. However, it does indicate if such information is provided in the original document so that users can refer to the original for the information if necessary.</p>					
17. Key Words (Suggested by Author(s)) Toxic substance OSHA standard NIOSH criteria Toxic monitoring Toxic protection			18. Distribution Statement Unclassified - Unlimited Subject Category 23		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 646	
				22. Price	